WOOD WORKING digest

MAY 1952

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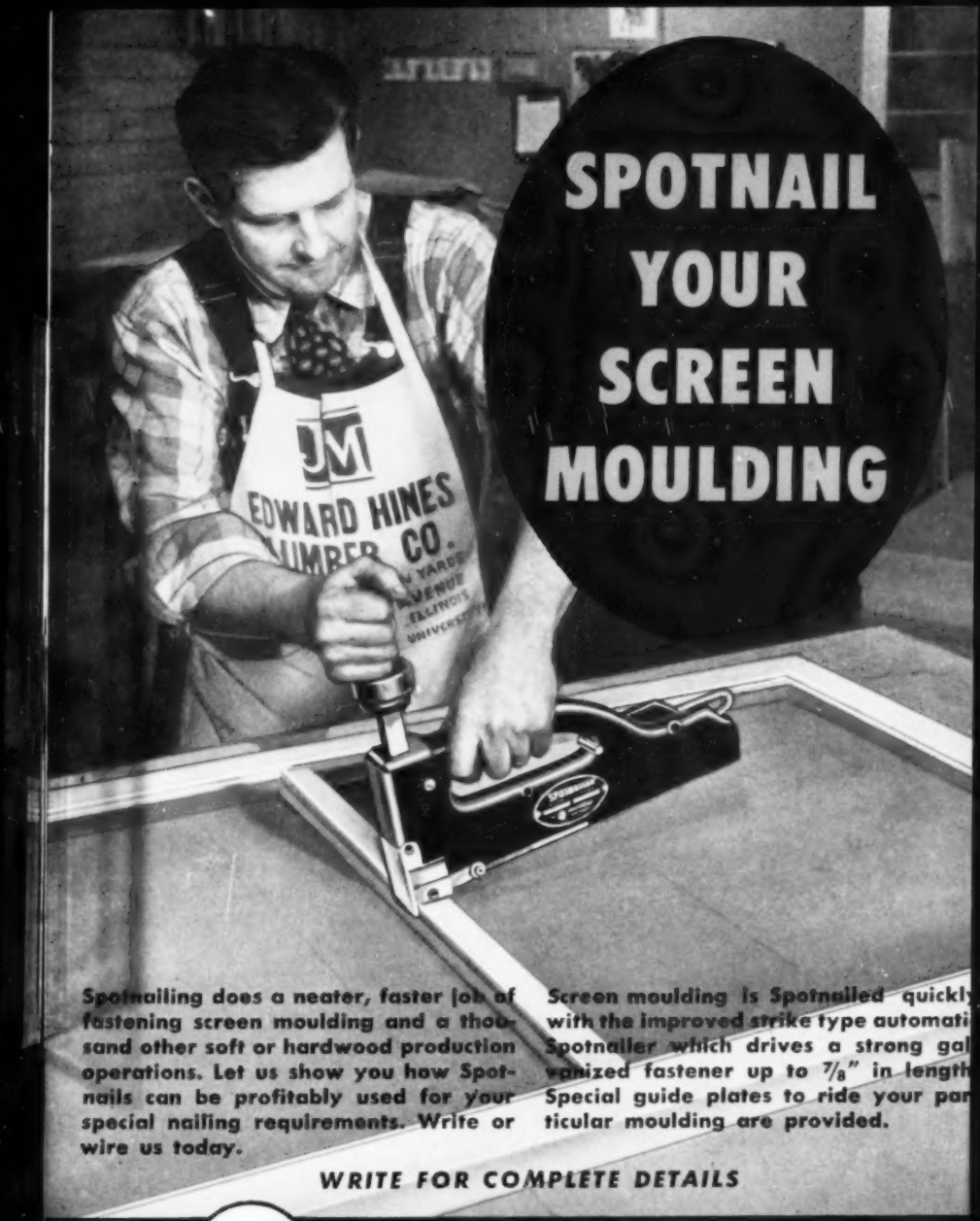
A HITCHCOCK PUBLICATION

THE INDUSTRY'S *No. 1* PUBLICATION

in

- Editorial Content
- Advertising Volume
- Effective Circulation

PUBLISHED MONTHLY SINCE 1898



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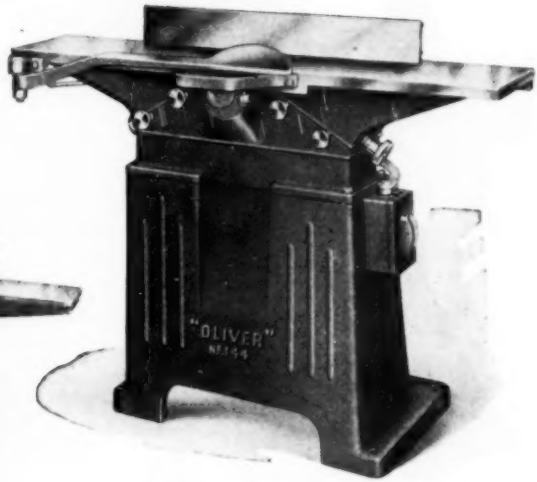

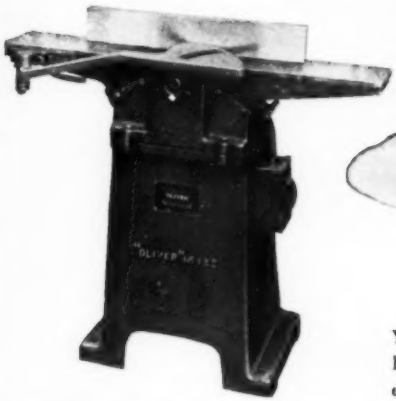

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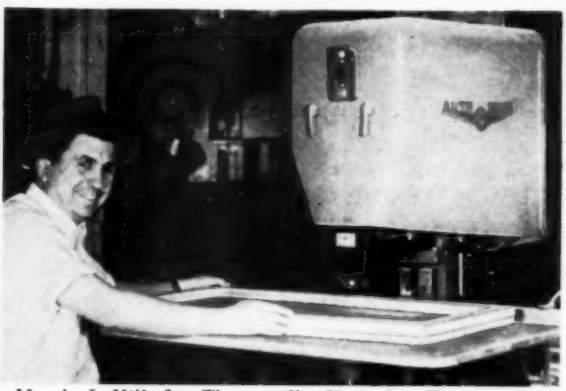

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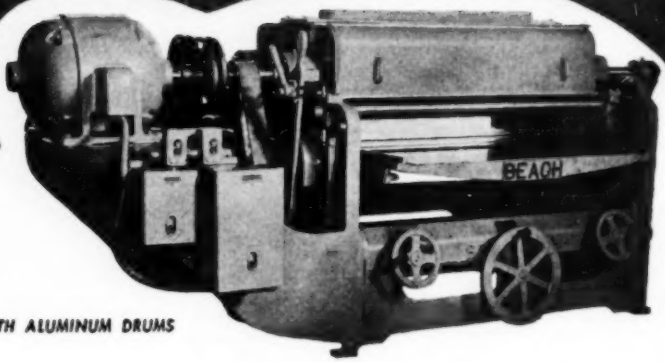

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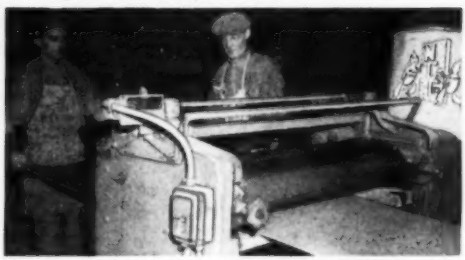

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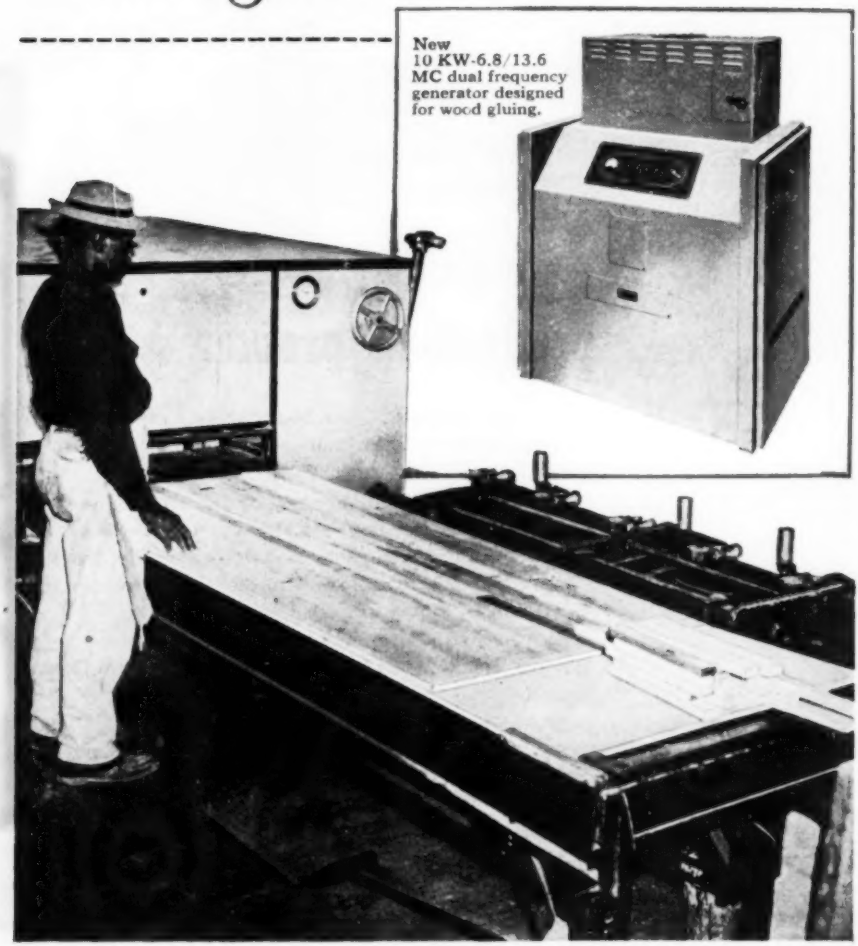

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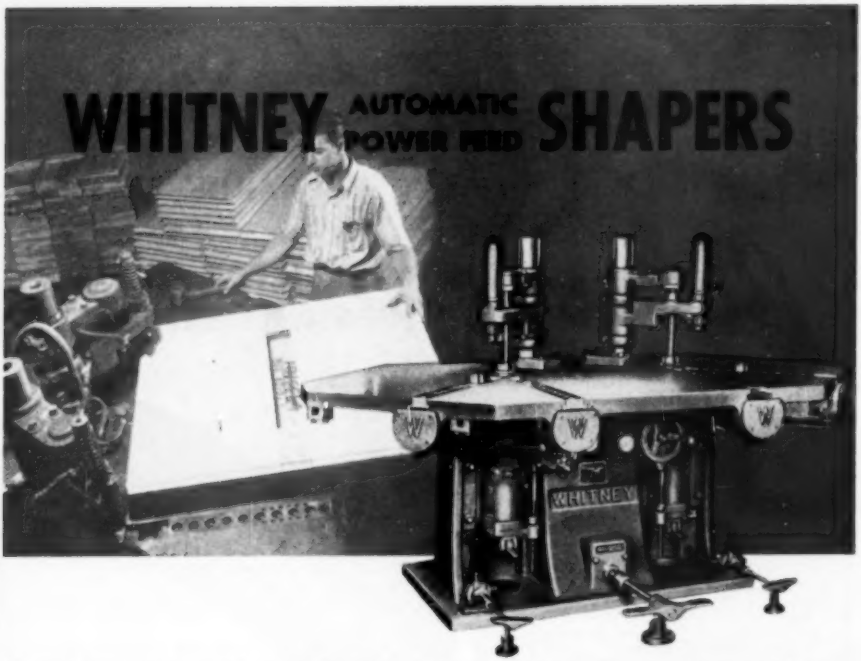

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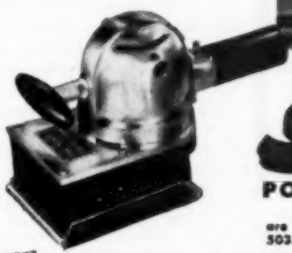

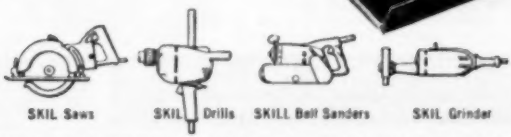

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14"	60	$153.50
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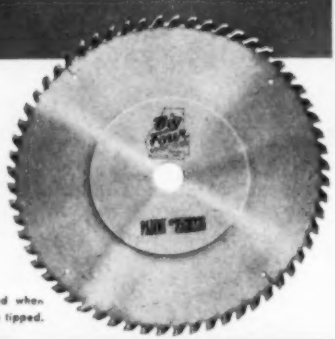
World's most satisfactory blade for smooth splinter and chip free finished. Especially designed for trimming, mitering and cross cutting fancy veneered panels, ply woods, decorative laminates and solid woods.



Expenses are clipped when it's Big Four Carbide tipped.

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TYPICAL PRICES

Diameter	Teeth	Price
5⅜"	6	$14.40
8"	10	$18.60
10"	10	$24.30
12"	12	$31.00
14"	14	$34.20

Revolutionary in design, performance and PRICE. Anti-kickback features mean less operating effort, carbide tips give longer life. Blades for all sawing operations available 5⅜" to 16" diameters. For portable electric, hand- or chain-fed machines.

"Ask your local dealer—if he is unable to supply you, contact us directly."

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For free comprehensive booklet write to: Big Four Carbide Tool Co., 5938 Carthage Avenue, Cincinnati 12, Ohio.

Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

While this is written, the middle of April, the National Association of Manufacturers and the Chamber of Commerce of the United States are conferring here in Washington privately to determine joint policy in regard to the steel seizure, and future wage and price stablization legislation. Picked men from all major industries represent both groups. There is, of course, the fear that what happened to steel will happen to other major industries.

As Washington soberly sees the trend, it appears to be the objective of those who make the policy of the Administration to make us think there is practically no direction or goal in our present activities. Actually, as Washington sees it, the goal is to socialize every industry and service. The object is to control directly the major industries, and to depend on the control of the major industries to control the smaller units of business. This appears to be the Administration's group aim. The other major group would attain the same result by creating what they call the corporative state. The corporative state would change the Constitution and make the Congress representative of the major industrial, service, professional, labor and similar groups, which do the business and the work of the nation.

It seems essential to understand what is in the Washington mind at this critical time because it will explain why there is a long delay in finally determining what is to be done about the Defense Production Act. Current sentiment in Congress is to drop wage and price controls. Congress hesitates because an increase in steel wages will enable Truman to blame Congress for price increases. Senators Dirksen and Schoeppel would like to abolish the present Wage Stabilization Board and set up a new one composed wholly of public members to be confirmed by the Senate. The resolution to investigate the Wage Stabilization Board is expected to be adopted late in April.

The National Retail Furniture Association was the only woodworking industry representative to appear at the hearing before the Senate Banking and Currency Committee. Vice President Leo J. Heer stated his organization accounted for more than 80% of total annual furniture store volume, geographically dispersed in ratio to population. "Even with controls established in accord with the Herlong Amendment, the typical furniture store experienced in 1951 a drastic reduction of 39% in operating profit before taxes, as shown by the nine months' figures available," said Mr. Heer. "It is important not only to retain the Herlong Amendment, but for Congress to make clear no legalistic interpretation should ever be undertaken by the administrative agency to vitiate its principle. There should be clarification of the Herlong Amendment by legislative action so that there is no discrimination in its application. The principle of the Herlong Amendment is that retailers shall not be deprived of their pre-Korean margins. Margin in retail accounting is the element in retail price above cost of goods out of which come all expenses of operation. When costs rise, operating profits before taxes are squeezed by whatever amount costs rise above the pre-Korean level, even if margins remain the same.

"In the home-goods field there are no shortages. Stringencies anticipated simply did not materialize. Price pressures are non-existent. Prices reflect competitive relationships. Consumer-installment credit control should be eliminated from the Defense Production Act by cancelling authority to control consumer installment credit in Title VI immediately. It has no effect on the overall economy but is highly discriminatory in its effect on specific trades singled out for the controls, and it is highly discriminatory on the income groups which rely on consumer-installment credit to buy goods available."

Those who would like to obtain a copy of Mr. Heer's unusually interesting analysis as presented to Congress should write to him at the headquarters of the National Retail Furniture Association, 1028 Connecticut Avenue, N. W., Washington, D.C.

John H. Martin, president, United Lumber Yards, Modesto, California, is the new Deputy Administrator in charge of Construction and Resources Expansion of the Defense Production Administration. He succeeds James F. King, who has been on the job since October 15, 1951. Martin will be responsible for all DPA activities which involve government financial aids to business.

Government bought upward of $10 million forest products during March and mid-April. Purchases were made by the Navy, Air Force, General Services Administration, Army, Post Office, Department of Agriculture. Army and Air Force Exchanges, TVA, Department of Interior and Veterans Administration. Army made huge purchases. The purchases include wood mauls, pallets, wood blocks, desks, drawing tables, work benches, storage cabinets, shoe lasts, shovel handles, tables, spoons, office chairs, wood chairs, lumber, switches, crossties, yellow pine, mail tables, furniture, plywood, broom handles, office chairs,

imrie "sipho-fan" progressive kiln

First scientifically accurate, high speed, progressive lumber dry kiln. Your present progressive kilns can be modernized without changing to compartment type kilns or altering handling methods. Equally efficient either end piling or cross piling. Imrie ElectroniK Control provides exact automatic control of temperature, humidity and ventilation during each progressive stage of the drying process. Retain the good features of your present progressive kiln layout. Keep storage and handling costs low. Convert at half the cost of equivalent capacity in modern compartment type kilns.

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PEARL & OTTAWA —
GRAND RAPIDS 2, MICHIGAN

office tables, moulding, benches, piling, oak lumber, cordwood, reefer strips, lance poles, shipping cases, box shooks, typing desks, utility caps, pine strips, plywood cases, plywood chests and ship decking.

Navy Department will shortly call for bids on 10,000 pallets of softwood construction (bolted) 48" x 48" with 2" decking, delivery at Seattle.

Certificates of Necessity for accelerated tax amortization, to speed expansion, were issued to logging camps, logging contractors, sawmills, planing mills, veneer mills, shingle mills, millwork plants, plywood plants, prefabricated wooden building constructors, makers of wooden boxes, wood household furniture manufacturers and other wood products; also, to woodworking machinery producers.

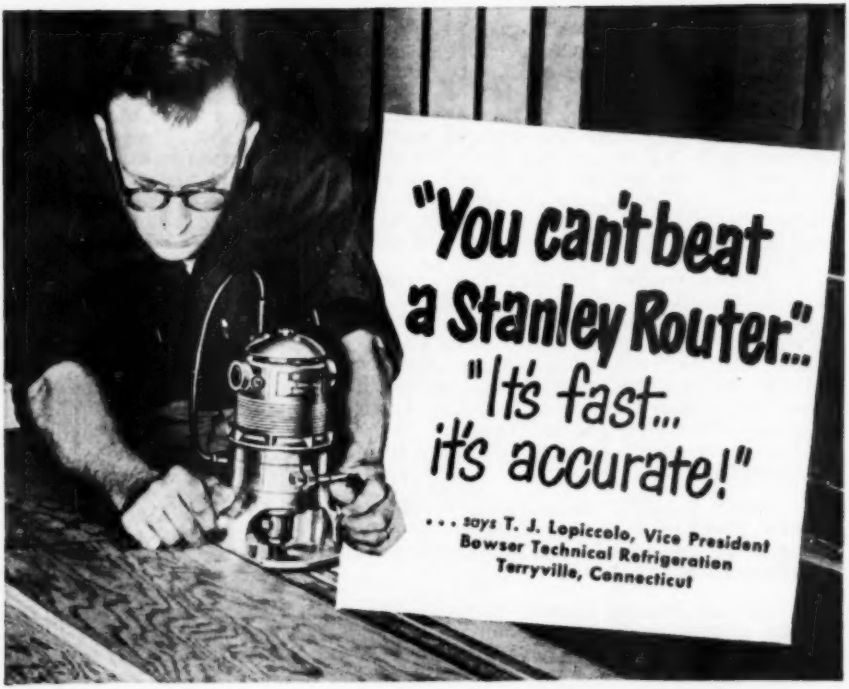
Bureau of Mines states aluminum formed to resemble wood shapes and products used in building field are on the brink of regular production. It is called "alumber," is nailable, may be cut, sawed and joined like the ordinary 2x4. It can be joined by drive screw and is to be used for window sills, joints, studs, purlins, beams, channels, door headers, base boards, trusses, interior and exterior trim.

Small Defense Plants Administration, jointly with NPA, defined criteria for obtaining supplemental allotments of controlled materials from the Small Business Hardship Account for the third quarter of 1952. The revised criteria require the firm must be small, as defined in the Commerce Department size study; it must produce preponderantly civilian-type items; it must be unable to maintain a minimum production and supervisory staff; and unable to secure other productive uses for its equipment by using substitute materials. Applications are screened by the Small Business Hardship Account Review Panel, composed of representatives from the Office of Civilian Requirements, the Office of Labor, the Industry Bureaus, all of NPA, and from the Small Defense Plants Administration.

W. D. Hagenstein, Chief Forester, Pacific Northwest Forest Industries, Portland, Oregon, appeared in behalf of the National Lumber Manufacturers Association before the Senate and House Public Works Committees. He called for an enlarged system of timber-access roads, emphasized, despite Federal Government ownership of 53% of the timber in the Pacific Northwest, private timber operators in the last decade have provided an average of 83.4% of the logs used for the manufacture of lumber and other forest products. He charged Federal Government is not, in fact, practicing the management and harvesting which it insists must be the policy of private operators.

While visiting in Washington, Henry Willins, Secretary-Treasurer, National Oak Flooring Manufacturers Association, pointed out items such as metal cabinets, tables and chairs, or plastic radios, are readily available in warmer, more beautiful and better performing wood. He urged there should be more wood desks and file cabinets in government offices. He estimated the use of a 1000 board feet of lumber will save a ton of steel.

Operators of sawmills, planing mills and concentration yards in the southern hardwood region now come under CPR 132,


"You can't beat a Stanley Router..."
"It's fast... it's accurate!"
... says T. J. Lopiccolo, Vice President
Bowser Technical Refrigeration
Terryville, Connecticut

Mr. Lopiccolo adds, "In making our Pre-fabricated Insulated Panels for hot or cold walk-in rooms, we've learned to depend on our Stanley Router for cutting accurate 90° grooves in metal-clad plywood. Its micrometer depth adjustment allows us to cut through the wood without quite touching the metal. The Stanley Router's speed and power allows us to do this job fast and still get the smooth, even finish required. Frankly, it's the only tool available that meets *all* our requirements."

There's a versatile Stanley Router to meet your requirements, too . . . it's the tool with a thousand uses . . . has every feature for convenient operation and long life: light weight, high speed, surplus power, ball bearings, dust protection, and micrometer depth adjustment.

Have your Dealer demonstrate—or write for Catalog #96. Stanley Electric Tools, 433 Myrtle St., New Britain, Conn.

STANLEY

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HARDWARE • TOOLS • ELECTRIC TOOLS
STEEL STRAPPING • STEEL

which became effective March 29. They are the producers of rough hardwood and yellow cypress lumber which comes from Alabama, Arkansas, Florida, Louisiana, Mississippi, Texas, Oklahoma and parts of Tennessee, Georgia, South Carolina, North Carolina and Virginia. The regulation spells out dollars and cents ceiling prices in various widths and lengths of yellow cypress and the principal species of hardwood, rough, air-dried and green, for grades first and second, first and seconds one face, No. 1 common, No. 2 common and No. 3 common, and certain other grades, f.o.b. point of origin, per thousand board feet. Ceilings are at level of prices frozen January 26, 1951.

Nailed wooden box and shook industry has asked OPS for a formula tailored regulation. The industry manufactures nailed wooden boxes, crates and other containers for industrial and agricultural products, and sawn shook, or unassembled box lumber cut to individual box sizes. They wish a regulation to follow the pattern of CPR 84, which covers corrugated and solid fiber paperboard boxes. Pricing formulas in effect during the base period would be continued. The industry feels that the dollars and cents pricing devised by OPA under MPR 195 was very satisfactory.

Under S-2687, introduced by Senator Cordon, (R., Ore.), owners of timber lands, forced to give up part of their lands because of Federal needs, must be given an equal amount of government-owned land.

United States Forest Service has launched a two-year review of the nation's timber resources, going into prospective requirements, supplies and growth of timber; appraisal of timber conservation program; and a "charted course" for American forestry. USFS wants help from state and private agencies. Lyle F. Watts, United States Forest Service Chief, says the nation's "depleted timber lands are still inadequate." He says the prolonged national emergency is affecting American forestry and that America's responsibilities abroad will involve a drain on our forests. He terms the world timber supply, particularly softwood timber, as acute. The new program will be under direction of Edward C. Crafts, Assistant Chief of the Forest Service. He will be assisted by William A. Duerr, Assistant Chief, Forest Economics.

Hardwood veneer and plywood manufacturers made 2,309,000 square feet, surface measure, of their product during the fourth quarter of 1951, according to Census. This is a decrease of 5% from the third quarter production. Logs and bolts consumed in the hardwood veneer production amounted to 226 million board feet, 5% less than the previous quarter. Plywood production totaled 303 million square feet, 5% less than the previous quarter.

Members of the wood laminating industry met with the Lumber and Wood Products Division of NPA to discuss the needs for criteria to establish that laminates are not lumber but are engineered semi- or finished shapes of greater utility than sawed timbers; that there is a need for uniform specifications as to size, grade and species of lumber used in laminates.

New POSITIVE-LOCKING WEBBING FASTENERS *speed assembly*

Webbing is inserted through slots and looped back over itself . . . this adaptation of the simple but effective "luggage strap" principle ensures positive grip without danger of slippage.

One end is attached by positioning clip so that drawn stud locks in hole bored in tubing. Process is repeated at other end of webbing, using simple hand tool for leverage.

Result . . .

Webbing seats and backs are tight and smooth.

Webbing is firmly anchored both ends, not weakened by screws.

Seats and backs are as easy to take apart as they are to put together.

No special skill required.

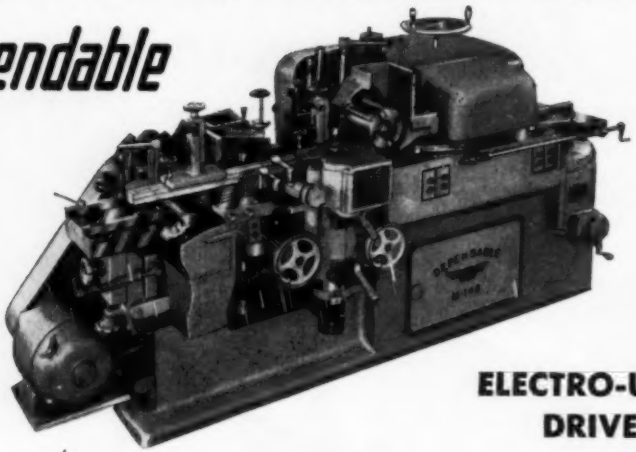
UNITED-CARR FASTENER CORP.

31 Ames Street, Cambridge 42, Mass.

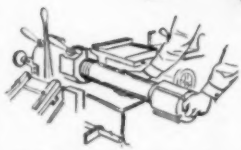
MAKERS OF **DOT** *FASTENERS*

TODAY'S BEST MOULDER BUY!

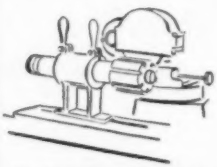
Dependable



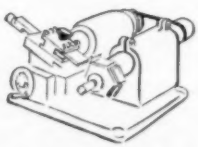
ELECTRO-UNIT DRIVE



Quick, easy removal of Cartridge Spindle Unit



Head being ground on Cartridge Spindle Unit



Head being jointed on Cartridge Spindle Unit

SIMPLIFIED DESIGN . . . makes it possible to produce this new high-production moulder at a much lower cost. Simplified design also simplifies operation; reduces maintenance and down-time, and increases production.

NEW CARTRIDGE SPINDLE UNITS . . . make it possible to set-up, grind, joint and pre-test all patterns in the grinding room. Change in pattern made in as little time as one minute.

VARIABLE FEED . . . U. S. Varidrive motor gives any feed between 20 and 150 feet per minute. Makes possible selection of proper feed for quality of finish desired.

FREQUENCY CHANGER ELIMINATED . . . heads individually driven by standard motors giving high spindle speeds for multiple and single knife work. Total of 35 H. P. on 8" machine.

HEAVY CAST IRON CONSTRUCTION . . . rugged, one piece base, gives smooth, vibration-free operation.

A MOULDER MAN'S MOULDER . . . in 4", 6", and 8" capacities. Convenient, quick-acting controls; 100% ball and roller bearing. Simple maintenance.

LOW IN PRICE . . . due to unique simplified design.

Write for bulletin C-12 and name of nearest dealer.

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Dependable MACHINE COMPANY

2320 High Point Road · Greensboro, N. C. · U. S. A.

MOULDERS · KNIFE GRINDERS · HEAD GRINDERS · KNIFE JOINTERS · KNIFE BALANCERS · RIP SAWS

DoALL *Certified* SAW BANDS

SET to Cut Faster and Longer

The SET of DoALL saw band teeth is *Certified* uniform to a tolerance of plus or minus .0015", with symmetry of set held within .0005".

Checking accuracy of saw set with an optical comparator in DoALL Saw Band Inspection Laboratory.

DoALL's "Strip-out" metal saw band box is resistant to moisture and damage in shipment and storage.

SET of saw band teeth is defined as: "the amount of displacement given each tooth to create side clearance for the back of the band when cutting through a material".

The set of saw band teeth must be held within extremely close tolerances to give maximum cutting speed and saw band life. Among the 83 separate quality control inspections given DoALL Saw Bands, several are devoted exclusively to checking the accuracy of saw set. Failure to meet tolerances means the band is rejected. Exacting inspections such as this at every step in DoALL Saw Band manufacture assure you of highest possible quality.

For best performance from any make of vertical or horizontal band saw it pays to buy DoALL saw bands. Literature free on request.

SB-115

The DoALL Company
254 N. LAUREL AVE.
DES PLAINES, ILLINOIS, U.S.A.

DoALL

38 Sales Service Stores in North America.

Tannewitz

HIGH SPEED BAND SAWS

THE MOST FOR YOUR BAND SAW DOLLARS

TANNEWITZ
GUIDE POST GEARED AND BALANCED steps up operator's efficiency.
VIBRATIONLESS DISC STEEL WHEELS — light, but perfectly rigid—cannot be deflected.
SIPHON DUST DISCHARGE and many other features of superiority, all described in our High Speed Band Saw Bulletin — write for it.
GUIDES WITH REVERSIBLE JAWS give double service.
AUTOMATIC TWO-WHEEL BRAKES instantly stop wheels when current is shut off or blade breaks — a tremendous safety feature.
SPEEDI-CHANGE RUBBER TIRES — no bolts or nuts required to hold them in perfect alignment.

The Tannewitz Works is not only the originator and oldest manufacturer of High Speed Band Saws, but today's outstanding SPECIALIST in the manufacture of this type of equipment!

This accounts for the fact that many Tannewitz features which are absolutely essential to securing the maximum advantage of high speed bandsawing, are patented and cannot be duplicated or successfully imitated; that Tannewitz machines are top producers in BOTH QUALITY AND QUANTITY; that the savings they effect quickly liquidate their purchase price. Get the most for your band saw dollars. Write for the complete facts, NOW, and judge for yourself. Simply ask for bulletin "GH". It pays to buy the product of specialists.

THE TANNEWITZ WORKS GRAND RAPIDS 4, MICHIGAN

If You Want To Cut Costs

YOU CAN ADD THIS UP **fast**

- DRIVES FASTER—*SAVES ASSEMBLY TIME*
- \+ HOLDS TIGHTER—*FEWER SCREWS NEEDED*
- \+ SAFER TO USE—*FEWER REJECTS*
- \+ DRIVES STRAIGHT—*SAVES RESTARTING SCREW*
- \+ FEWER OPERATIONS—*SAVES TIME*

IT ALL ADDS UP TO

Important Savings for you!

You can identify **TWIN-fast** by its relieved shank and twin thread

Get all the facts on this new screw that fastens wood to wood, metal to wood, or plastic to wood. It has four new basic improvements.

1. Relieved shank diameter
2. Parallel twin threads
3. Cylindrical construction
4. Single centered point

Can be furnished in either Slotted or Phillips Recessed Heads.

TWIN-fast

Reg. U. S. Pat. Off.
2,514,591 — 2,514,590 — 2,573,670
2,573,968 and 2,463,986

The Faster Driving ... Cost Cutting Fastener

WRITE TO ANY OF THE FIRMS LISTED TO LEARN HOW THIS REVOLUTIONARY NEW SCREW CAN SAVE YOU MONEY!

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Willimantic, Conn.

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Central Screw Company
Chicago, Illinois, and
Keene, New Hampshire

Continental Screw Company
New Bedford, Mass.

National Screw & Mfg. Co.
Cleveland, Ohio, and
Los Angeles, Calif.

Stronghold Pacific Corp.
Downey (Los Angeles), Calif.

Stronghold Screw Products, Inc.
Chicago, Ill.

Southington Hardware Mfg. Co.
Southington, Conn.

Townsend Company
New Brighton, Penna.

Please send copy of the new TWIN-fast bulletin.

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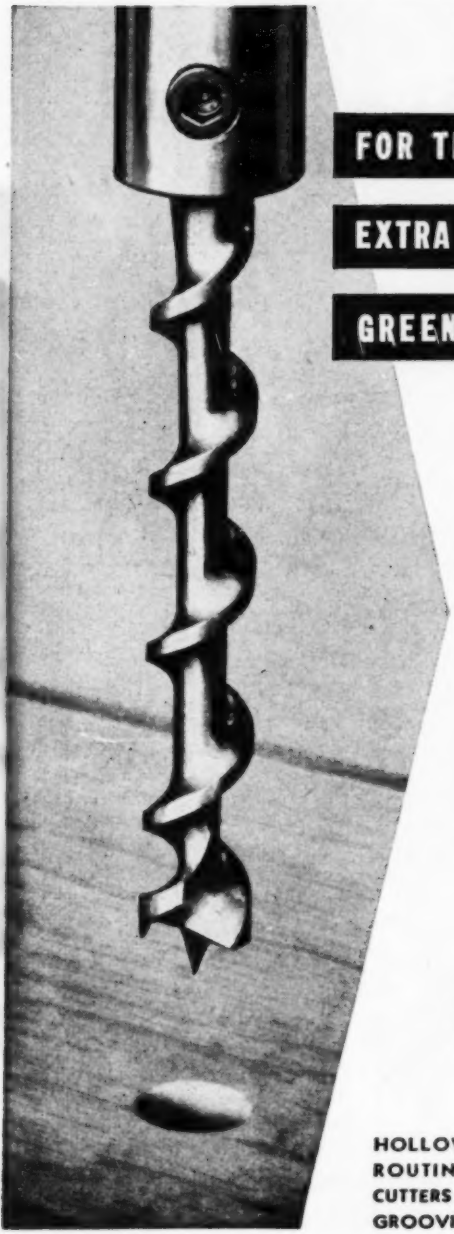

FOR THE TOUGH JOBS...

EXTRA STURDY, SOLID-CENTER

GREENLEE MACHINE BITS

On these boring jobs where you need an unusually sturdy tool you'll find the GREENLEE Solid-Center Machine Bit an outstanding performer. Its husky stem, or solid center, is a round section continuing from point to shank and increases in size toward shank . . . allowing proper clearance, yet a heavier body where strain occurs. Its accurate cutting edges are of extension-lip pattern with two cutters. Write for facts. Greenlee Tool Co., 2135 Herbert Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN

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HOLLOW CHISELS • MACHINE BITS • DRILLS ROUTING BITS • MULTI-SPUR BITS • PLUG CUTTERS • COUNTERSINKS • MAKERS OF TECO GROOVING TOOLS FOR TIMBER CONSTRUCTION

Where setting at room temperature is desired and rugged strength is a must

use PENACOLITE® RESORCINOL ADHESIVES

● Penacolite Resorcinol Adhesives are easy to apply . . . hard to weaken. On large jobs or small, curved application or straight . . . in *all* wood bonding . . . they form a permanent bond that is as strong as the woods they join. And Penacolite Adhesives remain strong through temperature variations from -40°C. up to charring heat! Penacolite Adhesives cure at room temperature . . . without the aid of strong catalysts or special applicators.

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PENACOLITE RESORCINOL ADHESIVES

Quick Answer...

to your Cutterhead and Cutter Questions

Just released—condensed catalog of Diehl's complete line of cutters and cutterheads. The catalog provides a handy reference of the latest data on stock heads and cutters and engineered-to-your-problem heads and cutters. Send *now* for this illustrated, informative, quick-reference booklet.

Write to The G. M. Diehl Machine Works, Inc., Wabash, Indiana, for Bulletin No. 452.

CUTTER DIVISION

On the Banks of the Wabash

THE G.M. Diehl MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.

Are you chained to a slow, costly wood gluing method?

Thermatron

HIGH FREQUENCY GENERATORS AND EQUIPMENT

. . . For Permanent Wood Bonding in a Matter of Seconds!

Seen in the jig is an entire cabinet assembly to be glue-set electronically by THERMATRON in only 30 seconds. The bond is stronger than the wood itself by actual test! Hidden in the background is the 3 KW generator which masterminds this job.

The saving to you in time, labor, floor space and expensive veneers is immeasurable . . . And the bonds produced are stronger than the wood itself. Costly clamps and clamping time are eliminated, and there are far less rejects.

THERMATRON supplies the complete installation, including generators and jigs, under one contract and one responsibility. The immediate production savings THERMATRON brings you are often more than the initial installation cost.

Write us today for complete details about your bonding problem . . . We'll be glad to offer guidance without obligation. And ask us for our instructive bulletin No. WD-14

HIGH FREQUENCY GENERATORS AND EQUIPMENT FOR ELECTRONIC GLUE DRYING • BENDING • EDGE GLUING • VENEER BONDING

Standard stock generators available from 500 Watt to 20 KW output, operating on 110 or 220 volt lines. Larger size generators up to 100 KW can be supplied for larger requirements.

*T. M. Reg. U. S. Pat. Off.

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RADIO RECEPTOR COMPANY, Inc.

Since 1922 in Radio and Electronics

Sales Dept.: 251 W. 19th St., New York 11, N. Y. • Factory: 84 N. 9th St., Brooklyn 11, N. Y.

INCREASE PRODUCTION as much as 100%

Lift Installed at	Production Increase
Double Surfacers	40% to 75%
Rip Saws	30% to 60%
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Matchers and Edgers	20% to 40%
Stacking Kiln Trucks	50% to 100%
Box Car Loading Dock	25% to 50%

INSTALL LEITELT LUMBER LIFTS

A glance at the above figures, FURNISHED BY USERS, proves how Leitelt Lumber Lifts increase production.

You can get these profitable increases in production and save the labor costs of one or two men with a Leitelt Lumber Lift in your plant or yard. Leitelt Lumber Lifts are built in a full range of capacities for handling loads from three to thirty tons easily and safely.

Let Leitelt engineers solve your production problems. Write Today.

Also Manufacturers of Power Transfer Cars Car Pullers Power Driven Turntables Subcars and Leitelt Swing Tables

LEITELT IRON WORKS

"Pioneer Builders of Lumber Lift Equipment"
400 Mill St., Grand Rapids 2, Michigan

A typical modern installation showing a Leitelt Lumber Lift feeding two cut-off saws. This is how one of the largest table manufacturing plants in the country has increased their production at the vital point where material starts to flow through the plant.

For SAW FILES that cut smoother, say...

Say it once, and you'll say it again . . . because Simonds "Red Tang" is the file that's made in top-grade only. Each type is especially designed and *Prover-tested* to cut fast and free, to stay sharp longer, to save time and "elbow-grease" . . . and to leave keener-cutting saw teeth. Ask any experienced saw filer. Then ask your dealer to supply you with "Red Tangs" *now.*

Branch Offices in Boston, Chicago, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que.

SIMONDS
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NOW! YA "400" SERIES

VISE-GRIP CUTTERHEADS

with MILLED-TO-PATTERN BITS

costs no more than

SQUARE HEADS WITH HAND GROUND KNIVES

That's right! You no longer need to grind knives to pattern, use valuable time to set up and then run your job with only two knives. Equipped with milled-to-pattern bits, the YA 400 Series Vise-Grip Head does your job better . . . cost-wise, time-wise . . . not only on long runs, but on short, repeated runs. Consider these seven specific ad-

- No grinding knives to pattern
- Faster feed rates
- More knives in the cut
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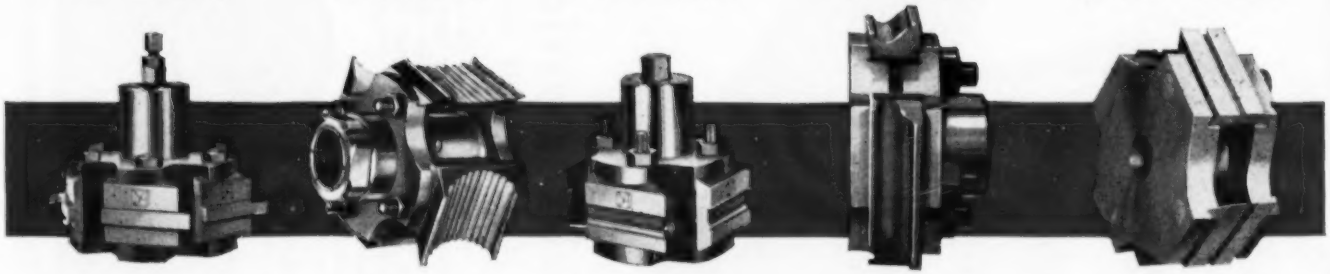
- Lower initial cost

ON MATCHERS | ON MOULDERS | ON STICKERS | ON SHAPERS | ON GLUE JOINTERS



SERIES 440—The Series 440 Vise-Grip Cutterhead with Closed End Sleeve can be equipped with bits to cut patterns up to 3" wide.

SERIES 430 — With milled-to-pattern bits, accuracy can be held even with the most particular patterns.

SERIES 440—The Series 440 Vise-Grip Cutterhead, shown here with sash moulding bits.

SERIES 410—For shapers with cutting circles of 4 inches or more. Equipped with pattern bits.

SERIES 410—Equipped with milled-to-pattern bits for use on a glue jointer, or to cut glue joints on shapers.

Yates-American

BELOIT, WISCONSIN

BRANCH OFFICES: CHICAGO, ILLINOIS; HIGH POINT, NORTH CAROLINA; MEMPHIS, TENNESSEE; PORTLAND, OREGON.

MATCHERS

BAND RESAWS

SANDERS

SURFACERS

CIRCULAR RIP SAWS

I wouldn't have a table

WITHOUT IT!

Wabash equalizer action

MEANS EXTRA SALES FOR YOUR TABLES

IMPROVE your extension table design with Wabash Equalizer Slides. Smooth, easy operation and increased convenience adds extra sales appeal. Have the extension features of your new tables styled by specialists at no extra cost. We manufacture a complete line of "no-sag" slides, folding leaf equipment and top locks.

65 Years of Specialized Extension Table Experience

Write **for free Engineering Consultation Blank**

B. WALTER & COMPANY, INC. • WABASH, INDIANA

B. WALTER & COMPANY, INC. WABASH, INDIANA

Walter of Wabash

LET'S FACE IT . . . GREEN LUMBER PRODUCTS JUST WON'T SELL!

● With today's net profit on most unit sales at an all time low, every woodworking operator knows it's more necessary than ever to increase production and eliminate waste and green lumber rejects.

Protect YOUR Profits! Rely on Standard dry kiln internal fan construction and automatic reversible cross-recirculation for faster, more uniform drying under exact conditions throughout every kiln load. *Rely on Standard to cut operating costs!* Whether you need a single unit, a full battery of kilns, or need to remodel your old natural draft installations for maximum profit-building results, get the facts . . . *YOU'LL* want Standard too!

Manufacturers of Internal Fan Kilns

Write for illustrated Standard Catalog

STANDARD
Engineers and Manufacturers Since 1887
DRY KILN COMPANY

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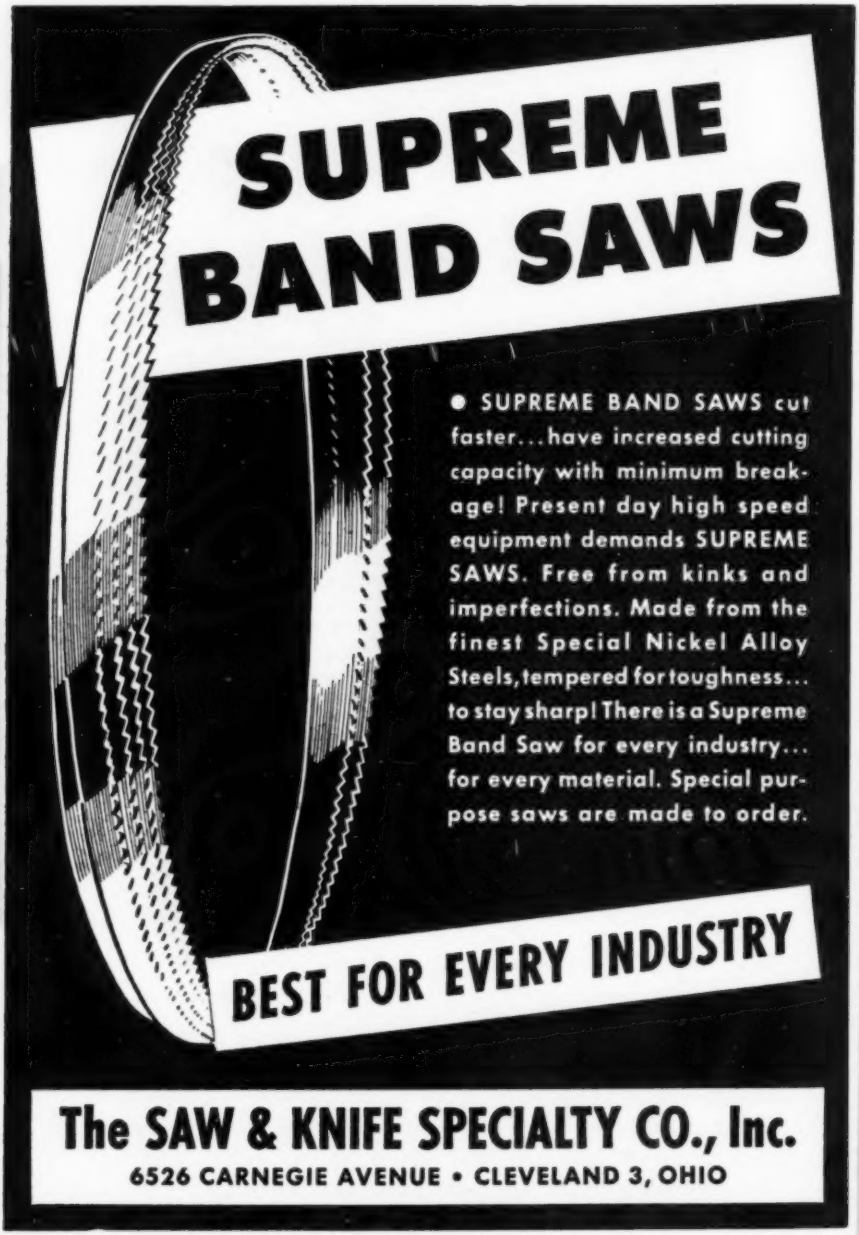

SUPREME
BAND SAWS
● SUPREME BAND SAWS cut faster...have increased cutting capacity with minimum breakage! Present day high speed equipment demands SUPREME SAWS. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness... to stay sharp! There is a Supreme Band Saw for every industry... for every material. Special purpose saws are made to order.
BEST FOR EVERY INDUSTRY
The SAW & KNIFE SPECIALTY CO., Inc.
6526 CARNEGIE AVENUE • CLEVELAND 3, OHIO

Our Present Opportunity

At the Southern Hardwood Producers' recent meeting in New Orleans, several splendid addresses were given. Two we are publishing in this issue of WOOD WORKING DIGEST.

One is by Lee Robinson, president of the Mobile River Saw Mill Co. He had for his subect, "What The Industry Needs Most." This practical lumberman certainly knew his subject and gave sound advice on how to win back many lost markets and develop new ones with practical and applicable ideas for the entire industry. One remark he made impressed me very much. He said, "We will never again have an opportunity like the present one."

The other address was just as good in its field of endeavor, "The Anatomy of Selling," by E. J. Lauesen, vice president of Fuller & Smith & Ross, Inc. We have heard and read many discourses on selling, but I don't remember any that compared with the clarity and comprehensive understanding in Mr. Lauesen's presentation. Every one of our readers should study this article and apply it to his own operation. If you are not getting the sales results you should, this article may open up a new sales approach that will do the trick.

We feel that Jim Heatherly, secretary-treasurer of Southern Hardwood Producers, should be complimented for the excellent meeting his organization held and the timeliness and selection of the speakers and their subjects.

In view of the serious attitude of the lumbering industry toward this important matter of disappearing markets, WOOD WORKING DIGEST, in cooperation with various lumber associations, is working on a plan that will stress the new and lost uses of wood. Inasmuch as our readership represents one of the largest markets for lumber that there is, we believe this cooperation will be of great value to both our readers and the lumbering industry.

Just one illustration of what WOOD WORKING DIGEST is doing takes the form of research in preparation for our Directory Issue. We plan to feature an article about 100 American species of wood, their identification and description of the uses for which each species is best suited.

Ned Bailey

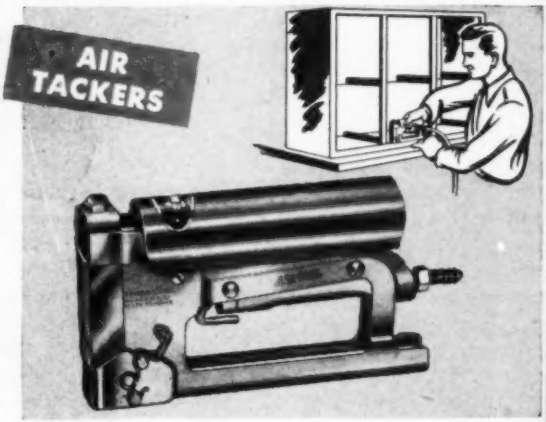
Editor-in-Chief

DUO-FAST

TACKS BETTER QUICKER

MORE WORK, in less time, using fewer workers—that's the story on Duo-Fast Automatic Tackers.

WIDELY USED in cabinet and woodwork shops, furniture plants, sash and millwork factories, toy makers, for a wide variety of tacking jobs.



A COMPLETE LINE 85 models available including AIR TACKERS, HAMMER TACKERS, GUN TACKERS, and STRIKE TACKERS. Line includes the one to save you time and money.

DUO-FAST FEATURES all steel construction for long service—Jiffy Jaws for easy cleaning—fast back-end loading—positive driving action—important Duo-Fast Free Service Guarantee.

50 Sales & Service Offices in Principal Cities

WRITE TODAY FOR YOUR COPY OF THE DUO-FAST CATALOG & PROFITABLE SUGGESTIONS

FASTENER CORPORATION

858 Fletcher Street • Chicago 14, Illinois

Pointed PARAGRAPHS

In a recent survey of prefabricated house manufacturers, almost half of those reporting manufactured products other than houses. The percentage of the firm's business devoted to such products averaged 35%.

Other than prefabricated houses, these firms produced millwork, boxes, crates, furniture, garages, warehouses and farm buildings such as brooder houses, milk houses, poultry houses, etc.

The prefabricated building industry is rapidly growing to major importance and the surface has not been scratched. You who are not already in the business, if your equipment will permit, investigate its possibilities.

Westinghouse Electric Corporation will build the complete power plant for the world's first atomic-powered submarine—the U.S.S. Nautilus—including both the nuclear reactor and the associated propulsion equipment.

The possibility of oak-wilt becoming a dangerous menace is gradually becoming less as new methods are being applied to control it.

Last year softwood lumber mills produced more than they could sell. This year they are glad to find orders and shipments topping production. National lumber trade barometer places '52 softwood shipments well above output and orders nearly 20% above.

With a 60% regain in price since the break last autumn, Douglas fir plywood is in a constantly improving position, supply and demand both rising, with demand considerably over production.

We hope that NPA will not be forced to carry out its threat aimed at manufacturers of consumer durable goods, which includes furniture, that it will, "compel volume maintenance if voluntary production

shows any drastic curtailment in low and medium priced merchandise." To date no noticeable reduction in production of these items has been observed.

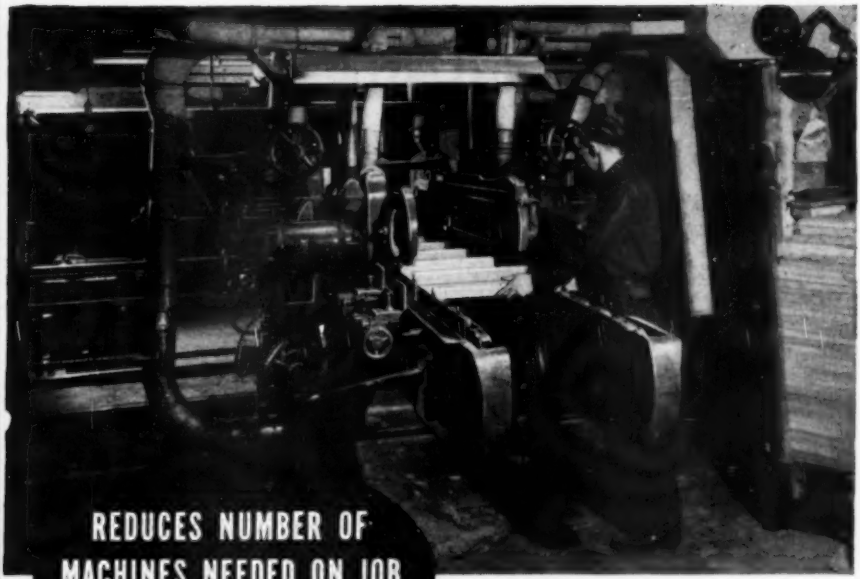
The spring convention and conference season is here. We are attending many of them and are having a good time meeting old friends, even Stanley Horn who looks and acts younger than ever, God bless him. Maybe it's me, but there seems to be a much more serious attitude on the part of the industry than there has been in the past. Another is a more realistic approach to research and the utilization of its findings. Utilization of wood waste is finding many items coming out of the sawdust and scrap heap. The old sand box for kitty has been replaced by a far more satisfactory and disposable chemically treated sawdust. Also have you seen that valuable new kitchen size chopping block being produced by the E. L. Bruce Company of Memphis?

The National Lumber Manufacturers Association discussed laminated wood products and all-wood truck bodies at their February meeting. Use of laminated wood products in World War II shipbuilding set a record. It is proposed to use some of the same techniques for the new truck bodies—making them of molded veneer and laminated lumber which will compare favorably with steel.

Buyers of home furnishings now have to be traffic experts as well. Recent increases in transportation rates for furniture amount to as much as 118% in some cases, according to Gen. Lawrence H. Whiting, president of the American Furniture Mart, Chicago. LCL freight rates on shipments of furniture as used by the typical store went up from 50% to 112% in 1951. The rails are pushing for another increase. "Unquestionably, the railroads are plagued by inflationary trends as much or more so than most fields of business," said Whiting. However, the increase in freight rates has meant a shift to trucking and further loss for the rail carriers.

A Memphis furniture manufacturer found the cost of operating a fleet of road trucks, which covered a total of 453,151 miles in 1951 to be .1826 per mile, including depreciation, maintenance, tires, mechanical repairs, fuel, state and road taxes and drivers' wages. The costs are based on one-way trips, "dead heading" home, but this firm is now investigating having the trucks bring back lumber, veneer, dimension stock and other materials.

The ingenuity of America is unlimited! Where the demand exists a way will be found to supply it and certainly lumbermen do not have to be told that short supply of some material may give the the woodworking industry an opportunity we cannot afford to pass by



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Here is just another example of the many important savings and production benefits a GREENLEE Double-End Tenoner makes possible . . . from the machine room on through the cabinet and finishing rooms.

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Modern SAW LOGS *Do a* STRIP-TEASE

PART 3

By PAUL H. GRAHAM

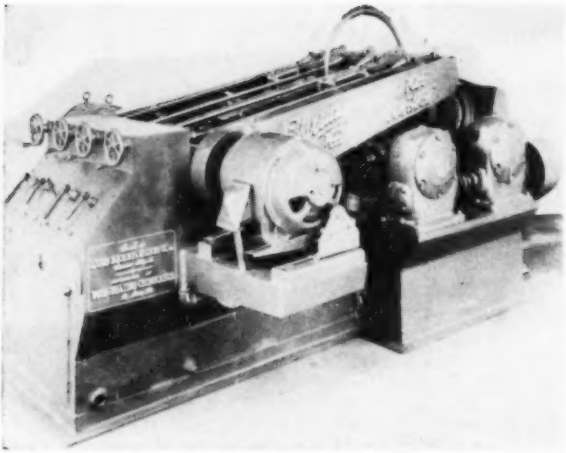
THE Division of Forestry Relations of the Tennessee Valley Authority recently developed a tight chain post peeler. This was done because of excessive chain wear experienced when using commercial slack chain peelers in post treating investigations and demonstrations.

The barker can be built for an estimated material cost of about $100 and operating costs are said to average less than four cents per post. This barker features the use of tight chains under elastic tension provided by heavy-duty rubber hose or coil springs. Rubber hose sections are cheaper, but coil springs are easier on the operator. Chains of hardened steel, similar to those used in cross links of truck tire chains, are also recommended. Commercial production of this machine has not been authorized, but TVA does not object to its construction for individual use without payment of royalty.

The tight chains are fastened to the chain head in a horizontal "X" arrangement to beat and rub off the bark without doing any appreciable damage to the wood in the revolving wheel or disc head. Both a top feed roll and a bottom feed roll are used in advancing the post to the flailing chain head. Posts 4" to 5" in diameter are peeled by feeding across the top of the chain barking head and the weight of the post is sufficient to hold it against the revolving head. Smaller posts must be fed against the lower side of the post and from the opposite side of the machine. The bottom feed roll serves as a fulcrum to permit the post to be held against the chains.

A 5 h.p. gasoline engine is usually used to operate the machine and best results seem to be obtained with the peeling head revolving at about 800 r.p.m. Posts are peeled by feeding them back and forth over or under the chain head and a skilled operator can peel about 200 posts per day. Two of these tight chain post peelers have peeled more than 10,000 pine and hardwood posts since construction and two men on one machine peeled 450 posts in an 8-hour day. Where the machine can be permanently mounted, electric power should be more satisfactory than gasoline power as depreciation and maintenance costs would be much less.

As previously stated, this tight chain post peeler is not available commercially but instructions for its construction for individual use may be obtained by application to Tennessee Valley Authority, Division of Forestry Relations. This type of barking equipment has little application in the barking of saw logs but is mentioned to permit



Hurricane post peeling machine is a two-cutter head machine with heads flexibly mounted. It barks poles driven through the machine with specially designed bull wheels mounted on movable bases adjustable to govern speed and direction of pole travel. Shoes on cutter head govern depth of cut. Machine peels 35' pole in one minute.

Courtesy Efurd Machine & Welding Co., Inc.

the inclusion of all standard types of barkers and to provide information for possible application to meet special barking problems. The usual length limitation for equipment of this kind is about 6 feet.

Hydraulic barking of pulp logs is not new, but newer equipment and methods have been developed which are suited for use on saw logs as well. Some of these have been developed especially for processing saw logs. Many of the hydraulic barkers have been adapted from other standard barker types.

One of these machines was adapted from the conventional post peeling barker. It substitutes twin nozzles in the cutter head for the knives. The nozzles serve to rip the bark off the revolving log with a water stream delivered at about 1,000 lbs. pressure. Another hydraulic barker adapted from a conventional lathe barker is a self-centering machine that turns the log while a 7" jet travels the length of the log and throws a stream of water, about 650 lbs. pressure, to remove the bark.

Hydraulic barkers were first used in mills of the West Coast where they were naturally required to handle logs of large diameter (up to 10 ft.) and long lengths (up to 50 ft.). Their construction was required to be massive and sturdy as single logs are processed which weigh up to 37,000 lbs. Regardless of design, all hydraulic barkers operate with the erosive action of high-velocity water to rip the bark off the logs at pressures as high as 1500 lbs. p.s.i.

Logs are barked hydraulically by various methods: while they are rotated (as in a lathe) with a traveling water jet along their length; mechanically fed and rotated under stationary jets; or carried, while rotating or stationary, through concentric rings—stationary or revolving—where nozzles deliver high-velocity water perpendicularly against the bark of the log.

Hydraulic barkers are commercially available for barking small as well as large logs. There are many barkers especially engineered for saw log processing. Some of the larger hydraulic barker installations now in use process an average 500,000 board feet of logs

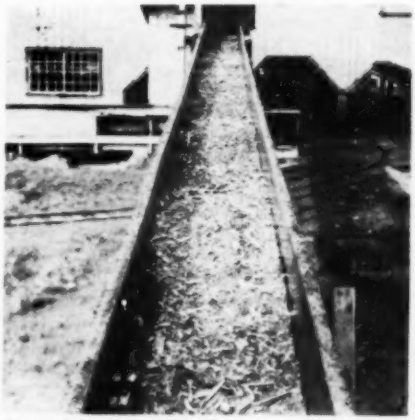
per day and have been custom-built to handle large logs.

In a typical large log hydraulic barker installation barking is done in a separate barker building which straddles an elevated log haul from the river and the discharge end leads to the sawmill. The barker is designed to handle logs from 18" to 120" in diameter and from 16' to 50' in length.

As the logs are hauled up by bull chain they are kicked from the log haul by a set of kickers installed in the log haul and operated by a steam cylinder. Each log is loaded onto a section of a six-chain reversible lift skid pivoted on the outer edge of the log haul to permit its being raised to place the log between the trunnion wheels. Two of these lift skids are used—one at the feeder end of the barker and the other at the discharge end. They are separated by an 8-ft. opening provided for the hydraulic jet nozzles.

Three loading arms provided on the loading lift skid are positioned at its pivot point to permit the log to be kicked back into the log haul as required. A similar set of five unloading arms are provided on the unloading lift skid at the other end of the barking deck. Steam cylinders power each loading section and loading and other operations are controlled by the operator from the cab by push button and lever controls.

As the loaded lift skid is lowered, the log to be barked is dropped into a trough formed by two lines of twelve trunnion wheels, about four feet between centers of opposite pairs and spaced lineally about twelve feet for the first pair and about six feet apart for the following pairs. The last two pairs are also spaced about twelve feet apart. The center line of the trunnion wheel trough is about twelve feet from the center line of the log haul.



Courtesy Jeffrey Mfg. Co.

Adequate means is provided to carry bark away from the barker by this Jeffrey double drag chain conveyor.

The arrangement of the two lines of trunnion wheels finds one row of idler rolls nearest the log haul, and one row of driver rolls, all independently swivel-mounted for angle adjustment, farthest from the log haul. These drivers have serrated rims and revolve at a maximum speed of 8 r.p.m. These trunnions are powered by a 35 h.p. motor. The log receives both forward (or backward) and rotary motion from the trunnion wheels set at an angle. Angle adjustments are made by the operator with push button control and vary the rate of speed of the log according to its diameter and bark condition. They are capable of 45 degrees adjustment forward and 15 degrees backward.

The log to be barked is fed by the trunnion wheels over two oscillating nozzles set at an angle of about 21 degrees toward the back wall of the barker building. This direct water discharges against the back and upper roof baffles, when the log is not in place, and then drains down through a screen, removing all bark before the water returns to the river from which it

was originally taken. The bark is carried off by a bark conveyor which operates between the trunnion wheels.

Each of the oscillating nozzles is mounted on a separate arm and the reciprocating action comes from the up and down thrust on a bell crank through an oil cylinder. The seven-foot nozzle standards or uprights are pivoted at the bottom of a steel super-structure which contains the complete hydraulic assembly. Quick recovery at each end of the oscillating movement is provided as the nozzle arm works against cushion cylinders. The oscillating movement of the jets—parallel to the log axis—is such that about a four-foot strip of bark is removed with one complete sweep of the nozzles.

Two pumps beneath the barker deck furnish the water pressure required to remove the bark from the log. These pumps are motor-driven units—one 900 h.p. and delivering 870 g.p.m. and the other 600 h.p., delivering 550 g.p.m. They can be operated singly or together to produce from 1300 to 1500 lbs. p.s.i.

Two conveyor chains, one under each lift skid and parallel to the log axis, dump into the nozzle pit where the water jets are. Two more conveyor chains here carry the bark off to a point outside the building where it is dumped onto a conveyor belt for transportation to the fuel line leading to the boiler.

The barked log is completely free of bark as it emerges from the hydraulic barking unit. After making its passage over the jets, which takes about a minute for the average log, the second lift skid removes it from the trunnion wheel trough and carries it to the log haul. Here a set of kickers kick the log back onto the log haul to continue its journey to the log deck in the sawmill. Slabs and edging produced from these clean logs are sent directly to the chipper as raw material for the sulphate pulp mill.

Another large hydraulic barker used to bark logs, up to 9-ft. diameter and 26-ft. length, employs a single high-velocity nozzle driven by a shot gun steam cylinder. This nozzle moves along the length of the log. The log is indexed on the trunnions between passes by the operator, who views the operation through a window in the casing. Two five-stage pumps supply water at about 850 lbs. p.s.i. and a three-stage booster pump is sometimes used to step this up to 1250 lbs. p.s.i. for tightly barked logs.

Smaller hydraulic barkers, originally designed for processing pulpwood, have now been adapted by sawmills to bark smaller saw logs. One of these which handles logs up to 24-inch diameter uses two sets of power-driven feed rolls, one with flutes and the other with spirals. Both rolls rotate in the same direction but at different rates of speed to impart both a turning and forward feed movement to the log. Each bed roll is driven by a separate motor through a variable speed unit, operating with a chain sprocket drive to the roll and with a friction clutch that slips at a predetermined load.

"It opens up a whole new field for plywood."

If both of these rolls are driven at the same speed of rotation, only a turning motion is given to the log as the spiral only rolls itself along the log. If the spiral roll is driven faster than the fluted roll, both forward feed and rotation of the log are effected. This important relationship must be adjusted to suit the species of wood, average diameter of the logs and condition of the bark according to the season of the year when the log was cut.

For example, where the water jets are set to remove about a 12-inch strip of bark and a 24-inch diameter log is in the crotch of the 24-inch diameter rolls, the spiral roll has a lead of 12 inches. Fifty r.p.m. on the fluted roll will produce the rotational speed required for good barking. For every revolution of the fluted roll, the log revolves once and a forward travel of 12 inches is required to prevent jet overlapping.

With a 12-inch lead on the spiral roll, the roll must be rotated at 100 r.p.m. to give a forward motion of 12 inches for each revolution of the log. This will provide the best combination of ratio or rotation for good results in barking logs of this diameter.

Smaller logs travel through the barker slower than large logs with a given roll setting. For instance, with a 12-inch log in place of the 24-inch log previously cited, the same peripheral speed is maintained—50 r.p.m. on the fluted roll. This speed, however, rotates the smaller log twice for each revolution of the fluted roll, but the forward motion is the same as the larger log—12 inches—at the same spiral roll speed. It is necessary to increase the speed of the spiral roll to 200 r.p.m. to prevent over-lapping of the jet.

The practice of setting rolls for average diameters may be satisfactory for seasons of easy bark removal, as in summer, but this does not work out in fall and winter when the bark is tight. While it is not absolutely necessary to have complete coverage of the log surface at certain seasons to produce 100% bark removal, setting the rolls to produce 100% coverage of logs of average diameter will remove all bark from larger logs as well.

Three spring-loaded baffle plates are used in the barking compartment to provide just enough pressure on the upper surface of the log to hold it in position in the roll crotch under the jets, but not enough to prevent rotation or forward motion. Baffle pressure is controlled by a spring-loaded air cylinder that also serves to cushion the baffle as it drops to a log of smaller diameter.

Pipe guards and guide plates arranged along the cabinet and above the bed rolls keep crooked logs from leaving the bed rolls if displaced, and return them to the jet area. Side baffles keep the bark and water inside the cabinet and direct them to the waste bark and water hopper. Water is prevented from splashing out of this discharge by a sheet rubber shield inside the housing. Pressure tips at the top of the cabinet direct the jets downward into the crotch of the bed rolls. A drag chain beneath the barking compartment delivers the bark and water into a screen for drainage and then carries the bark off for disposal.

A wing-type feed chain receives logs from the yard conveyor and centers them so they will enter the bed roll crotch as the logs reach the main barking cabinet. The wings of this chain carry the same radius as the bed rolls and the speed of the chain is synchronized with the forward motion of the logs on the bed rolls. An independent motor and variable-speed unit drives the feed chain from the top of the

cabinet. The barker feed is continuous and although the log rotates during barking, any log that is not extremely crooked can be handled by this barker.

Three heavy jets are used to bark the logs and the action of the jets tends to remove the bark in relatively small pieces. These small pieces can be easily handled. The log rotates on the bed rolls while the jets, from the high-pressure nozzles above, direct streams of water on the top surface to wash away the bark. The pressures used vary with the season and condition of wood. Although 650 lbs. p.s.i. is usually satisfactory during the easy barking seasons, pressures up to 800 p.s.i. are required on winter-cut wood. Water consumption ranges from 600 to 735 gallons per minute. Wood that has been frozen can be barked, but with considerable loss in rate of energy, by over-lapping jets on surfaces to draw the frost.

FIFTIETH ANNIVERSARY FOR N.L.M.A.

A golden anniversary meeting in celebration of the National Lumber Manufacturers Association's fiftieth year will be held May 8-10 in St. Louis, Missouri, at the Jefferson Hotel.

In 1902 the association's organization meeting was held in St. Louis, and once again it will play host to the nation's lumbermen as they gather to review 50 years of progress in the American lumber industry and the association.

The National Lumber Manufacturers Association is headquartered in Washington, D.C., and represents sixteen regional, species and product associations located from coast to coast.

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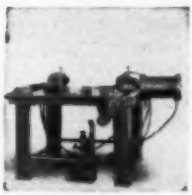

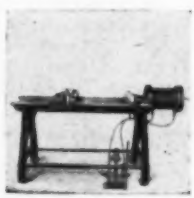

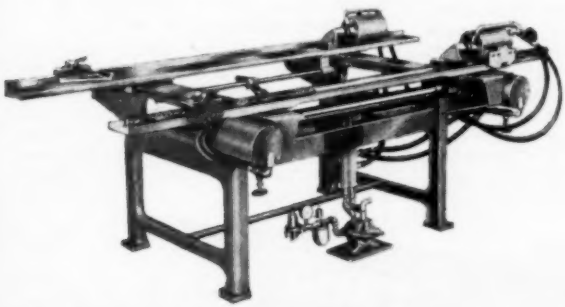

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WOOD WORKING DIGEST

MAY, 1952

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Machines, multiple saw cutting
Machines, router
Machines, routing
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Machines, scroll
Machines, shaper
Machines, tenoning
Machines, veneer slicing
Machines, veneer splicing
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Sanders, belt
Sanders, combination
Sanders, disc
Sanders, drum
Sanders, edging and trimming, portable
Sanders, portable electric
Sanders, spindle
Sanders, variety
Sandpaper
Saws, band
Saws, circular
Saws, scroll
Saws, portable
Saws, special
Saw Blades, band
Saw Blades, circular
Saw Blades, scroll
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The ANATOMY *of* SELLING

By E. J. Lauesen

TO begin with, let us define some of the areas of selling—selling as a cost; selling as a means of increasing or maintaining sales volume; selling to decrease production problems and selling as a process. It is this last category that will be our subject for present consideration.

Selling is often looked upon as being practiced by personable extroverts who persuade people to buy something they would not normally purchase. A common misconception arises from this emotional view, but we can clear it up quickly. No matter how personable a salesman may be, he cannot sell a product that is not needed nor wanted. He can only cause an individual to give one need precedence over another, and one means of satisfying that need precedence over another means.

Another widespread idea is that costs of distribution or selling are of an entirely different character from the costs of production—that they are less justifiable and that they are probably too high. Actually production costs and selling costs have many points in common. Some of these are handling, storing and transporting of goods. Selling is merely an extension of manufacturing. So inter-related are the two that it is possible to decrease the cost of one by increasing the cost of the other.

Two Fundamental Errors

Because the process of selling is misunderstood so often, we may make two

E. J. Lauesen

errors in our thinking about selling. Some management men actually stand in awe of selling because they do not understand the process. These people may overestimate what selling can do—they approach it as though elements of voodoo were part of the process. Therefore, they reason, if the voodoo rituals performed by star salesmen are carried out, astounding results will occur immediately. This attitude will obviously lead management into ill-defined selling programs which cannot possibly obtain results. Then inevitable disappointment causes some to feel that either they

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Mr. Lauesen is vice president and manager of Fuller & Smith & Ross, Inc., Chicago, Ill. This speech was presented at the recent Annual Convention of the Southern Hardwood Producers, Inc., held at New Orleans.

were never meant to be salesmen—the process of selling is too mysterious—or that there actually is nothing to sell.

My purpose is to strip away some of the mystery from this simple process. Whether we realize it or not, all of us engage in selling—practically everything we say or do is part of this process.

Twenty-two years in the selling field, and on both sides of the fence, have given me a great deal of humility in my approach to selling. There is so much to know about this subject which really holds the key to whether we will remain a free nation or gradually lapse into dictatorship. We must move goods in volume and move them cheaply or our standard of living will deteriorate and we will be even more dependent on central authority than we are during a period of war.

Discovery of Selling Process

Fortunately, much has been done in a scientific approach to selling. Some rather remarkable discoveries concerning the true nature of selling emerged from studies conducted in several universities on the subject of how the human mind comes into possession of a piece of knowledge. Actually, what is the process of learning?

Psychologists are pretty well agreed as to how the mind goes about acquiring a new piece of knowledge. First, the mind must settle upon an objective. For example, a man traveling by car from one place to another crosses a shallow ravine where his car becomes stuck in heavy mud. Now let us see how his mind comes into possession of a new piece of knowledge—how to get a car out of heavy mud.

His objective is clear. The second step is a definition of the obstacles in the way of the objective. These are quite clear, too. The automobile simply does not have enough traction in its rear wheels to push through the mud. Another obstacle is that the car seems to sink. Also the mud is slippery. The mind has defined the obstacles. Now for the third step—evaluation of the alternative methods of overcoming the obstacles.

THE PROCESS OF LEARNING
IS THE PROCESS OF BUYING

1. AWARENESS OF AN OBJECTIVE
2. DEFINITION OF OBSTACLES
3. ASSESS ALTERNATIVES
4. SELECTION OF BEST ALTERNATIVE
5. ACCEPTANCE - PLEASANT AND EASY

Here are some of the choices the motorist can make: apply more power; rock car back and forth; put gunny sacks from trunk under wheels; or walk to nearby farmhouse for shovel. The latter he does. He returns; removes the heavy mud from in front of wheels and the car pulls itself free.

There is a fifth step which is important after selecting an alternative. That is, that it was easy and agreeable to acquire a shovel and to make use of it. The five steps in acquiring a new piece of knowledge may be seen as: 1) awareness of an objective; 2) definition of the obstacles; 3) evaluating the alternatives; 4) selecting an alternative; 5) acceptance of the alternative as pleasant and easy.

Now our motorist knows that under the driving conditions he met, a shovel is the best way of extricating a car.

If this is the process by which the mind comes into possession of a new piece of knowledge, what does it have to do with the process which the human mind goes through in arriving at a decision to make a purchase? To many people, the surprising thing is that the two processes are actually one and the same.

We may illustrate that they are the same process with a description of the sale of an insurance policy. First of all, the prospect accepts as an objective that his son should have money upon graduation from high school to attend college. The salesman then helps the prospect define in his own mind the possible obstacles—sickness, death, loss of employment, business reverses, possibly a general depression.

The salesman then goes on to step three—helping the prospect review a number of alternatives for overcoming the obstacles. Some of these will include: investments on a regular basis, a savings account, assumption father will have an increased income. Another alternative is introduced—taking out an insurance policy. The advantages of taking out a policy help make the prospect feel that here is the obvious alternative. Step five comes quite naturally since the salesman offers several different ways of paying the premiums. It has become pleasant and easy to accept the purchase of the policy as the best alternative.

The salesman has now accomplished a feat which many capable manufacturers secretly envy. He has made a sale of an insurance policy to a man who up to this time had not even considered such a move.

Now let us go back to the statement made earlier that no one can be sold a product that he doesn't need and doesn't want. This viewpoint has an interesting opposite side—that it is easy to attain a satisfactory sales volume for any product that honestly fills a basic need.

In such an instance, the prospect actually does most of the job of "selling." This fact is illustrated by the frequent comments, "Selling that stuff is as easy as falling off a log;" or, "You've sure got a winner, that stuff has real sales appeal."

What these comments actually say is that the five steps to a sale of a given item were so clear to the prospect that no guidance was necessary. Many products have qualities suggesting a rapid run-down of the five points. Some products have no competition—no need for step four.

Now, having decided that the selling process is not one of mystery, what are the steps needed to put this well-defined mental process to work selling goods?

Steps for Building Sales Volume

There are five steps necessary to build sales volume, hold sales volume, or to reduce the cost of present sales.

The first step is to define the prospect's market—his objective. Let us say our hypothetical manufacturer is a hardwood producer and that he has a batch of elm to dispose of. His objective is to do so at the best profit level. It would be more profitable, probably, to dispose of it to a furniture manufacturer than to a manufacturer of containers.

In approaching the furniture manufacturer the lumberman may discover that the manufacturer has one of several goals in mind. Let's take a goal that may be hard to attain. Let's say he is a manufacturer of modern furniture and that he wants to increase his distribution and sales volume. The manufacturer must influence both users of the furniture and dealers. Therefore he must produce an attractive line and

a competetively priced line. He must have a margin of profit large enough to put adequate promotion behind the project. The lumberman feels he has the hardwoods that fit the situation.

The next step is to devise a selling approach interesting to the manufacturer. This step involves applying the five selling steps previously outlined. The mill owner sees that the obstacles standing in the way are the cost of the hardwood and the expense of converting them into a finished product, also the risk of gaining acceptance.

Alternative steps open to the furniture manufacturer would mean using aluminum, steel, magnesium, reinforced plastics, softwoods with veneer finish, or the product the lumberman wishes to sell. The lumberman can help his prospect arrive at the decision that hardwood is the right answer by studying the man's production problems and guiding him in selecting the proper grades for use in different parts of the product. Thus, his cost may be actually lower than it would be with any of the competing materials. Another advantage may be to show that wood has flexibility as far as changing design is concerned.

FIVE STEPS
COMPLETE SELLING PROGRAM

1. DEFINITION OF MARKET
2. SALES APPROACH
   (USE OF BUYING PROCESS)
3. SALES TOOLS
4. SALES TRAINING
5. INDIRECT SELLING EFFORT - ADVERTISING

There is another powerful, though little used, argument which springs from a very deep seated psychological interest. People fundamentally crave security. The closer they can get to nature, the more secure they feel. Pets, window boxes, picture windows, gardens, etc. may be enjoyed for a variety of reasons, but basically it is because of a desire for security. Lots of wood in a house, including beautiful furniture, helps to satisfy this craving. Whether we ever think of it or not, banks and investment houses, churches and certain types of public buildings make lavish use of wood because it has a deep appeal to human nature. It creates an atmosphere of solidity, soundness and helps satisfy a craving for security.

The mill owner should help guide the manufacturer in the preparation of promotion used to bring this appeal to the dealers and through them to the public. A couple of furniture manufacturers have told me that this is a sound viewpoint which they would like to employ. I understand some of the softwood people are beginning to sense the power of this basic appeal and are reaching out for ways to make use of it.

So far we have defined our market for a particular species of hardwood and for a particular manufacturer. We know something of the obstacles for him and available alternatives. We have also stated several elements of a sales approach that would cause him to select the lumberman's hardwood. If the lumberman will guide him in selection of grades and give him advice on finishing these grades, he will make it pleasant and easy for the manufacturer to select his product. This is step three of the sales approach.

Step four is the operation to develop whatever selling tools are necessary to put over the story. This may be literature and samples; helping the manufacturer develop appeals he will use; or

Saddles or scoops any shape or size of chair seat.

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SIX TO TEN SEATS PER MINUTE

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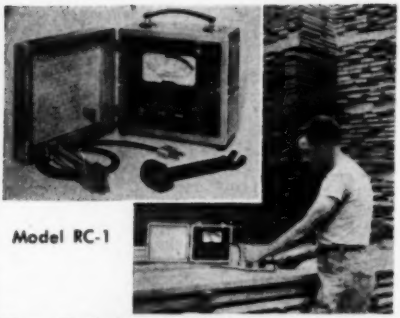
McKnight Machinery Company

Chair and Woodworking Machinery

GARDNER, MASSACHUSETTS, U. S. A.



Model RC-1

How Delmhorst Moisture Detector "has paid for itself several times"

. . . Texarkana Lumber & Supply Company tells of Moisture Detector benefits:

"We have been using your moisture detector both inside and outside of our dry kiln. By determining the moisture content of the lumber before planing, we are able to prevent the stock from bluing or molding in the bins after the stock is stored in the finish sheds. In this way the instrument has paid for itself several times.

"Also at times the moisture content of lumber is required on certain orders to be not over a certain amount. By using the moisture detector to determine the content of the lumber before delivery, we do not take the chance of delivering the lumber and having it rejected because of excessive moisture content.

"Again, many times the moisture content of lumber is a source of disagreement over a sale. We have found the moisture detector an excellent way to settle such disagreements.

"We can recommend this instrument highly and have found it to be satisfactory and accurate in every way."

Moisture Detector Features

Your business, too, can profit with a Delmhorst Moisture Detector. Use it to quickly determine moisture content of *any wood product* —there are no calculations to make—no conversion tables required—merely read the precise percentage of moisture content (within 6-65%) *direct* from the dial!

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City and State .....

it may be advice on design and wood machining.

Step five is ordinarily referred to as sales training. The lumberman may wish to train several representatives in dealing with selected processors of wood in the use of this and other sales approaches. Sales training is easy because the learning process and the selling process are one and the same thing!

There is one other step in a complete selling program which is concerned with the indirect or impersonal selling effort. It is commonly referred to as advertising. Your competitors, the manufacturers of aluminum, steel, magnesium and plastics make excellent use of preparing the way for acceptance of their materials in specific products. They never make the mistake, however, of advertising "aluminum for the sake of aluminum." Their advertising takes the form of convincing the public why aluminum is ideal.

There is no doubt in many people's minds that the hardwood producers should assist manufacturers of furniture in whetting the appetite of the public to satisfy its craving for security through a more lavish use of wood, not only in furniture, but in many other ways throughout their homes. Steel, aluminum and plastics cannot possibly compete on this plane—your advantage is clear!

Selling is Simple

The anatomy of selling is very simple. Understanding it involves understanding two processes—one, the process by which the mind arrives at a decision to purchase; two, an understanding of how to handle the five steps in guiding this process in such a way that it results in an increased sales volume at lower cost and therefore at greater profit.

Your objective as lumbermen is not only to increase your sales at the present, but to perpetuate your business.

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A QUALITY CONTROL DEPARTMENT . . . also our own DESIGN AND DEVELOPMENT DEPARTMENT, will assist you in engineering your product efficiently . . . and over FOUR HUNDRED EMPLOYEES whose primary interest is *Quality* will turn out your order in Quantity – and on time.

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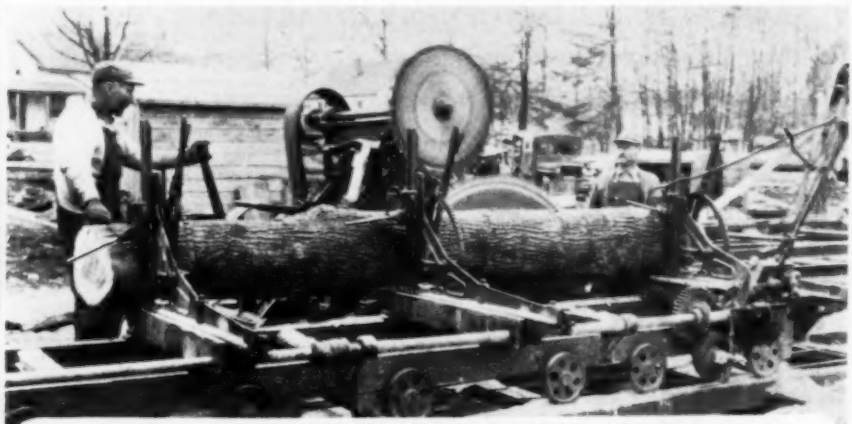
You have seen the use of hardwoods plummet from their highest level in 1907 to their lowest level in 1932. You have seen them gradually rise until at the present time their consumption is again at a respectable level.

Let's take a look to see which of the five steps of a sale you are now using to best advantage. I believe it is fair to say that you put most of your emphasis on step five. You make lumber available and reasonably easy to obtain. However, I am afraid that you allow your purchasers to select their own goals; to recognize their own obstacles; to evaluate the alternatives and finally to select hardwood as the best alternative. For the present, at least, this choice is made primarily because of a shortage of wood substitutes.

In other words, I am saying that an economic vacuum is siphoning your product out of your mills. You are not pumping your product through the channels of trade to the ultimate user. Temporarily you have a chance to re-establish your markets—due to the handicaps placed on metals. It seems reasonable to urge that you seriously consider taking the necessary steps to set up the machinery to force your products out of your mills and into the market. Metals and other substitutes will again break the vacuum and reduce the power of the siphoning action which is now helping you.

The Necessity to Sell

As a quick review, let's turn these five points upon you as southern hardwood producers to see why you should "sell." Your goal is to sell more hardwood. The obstacles are a composite of all of the problems faced by the processers who could use lumber in the manufacture of their finished products. There are the obstacles of not knowing where to use particular grades of par-



"IT'S A PLEASURE TO SAWMILL WITH GOOD EQUIPMENT"

That's why B. H. Nicely and Boyd L. Nicely, father and son, operate two Frick mills, a No. 01 at Cranberry, North Carolina, and the large No. 1 with top rig, shown above, at Gaithersburg, Maryland.

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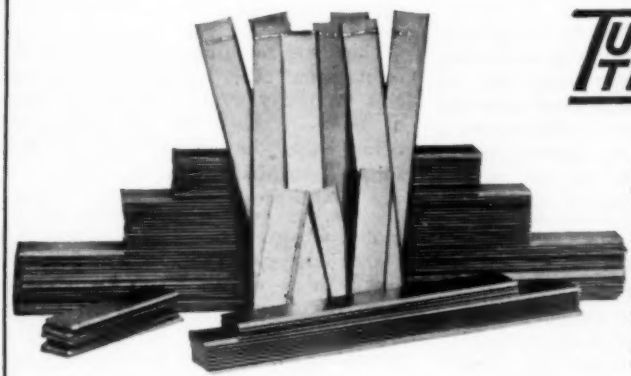
ticular species. There are obstacles concerned with buying cycles; with ups and downs in purchasing power; obstacles concerned with changes of taste. Other obstacles involve the efforts of manufacturers of substitutes for wood to further cloud the issue.

Your alternatives are limited to two. They are either to get out and promote the various species and grades of hardwood for specific uses, or to allow nature to take its course. This, of course, involves depending upon the manufacturers of items which could use hardwood to seek out sources of hardwood supply rather than substitute materials. What you are actually relying on in this case is a shortage of substitutes, or on a traditional demand for wood. But we must always remember that tradition is a passive, not an active force. It is easy for a tradition to change almost overnight when the forces of promotion are given full play.

I don't believe it will be difficult for us to arrive at a selection of the right alternative. That is the alternative which in effect says we are going to present the advantages of hardwood for specific uses to the manufacturer and to the ultimate user of the items. We are going to include in our own cost structure a cost for perpetuating our business and treat it with the same regard we do a cost factor for depreciation of machinery. This is what the suppliers of substitute materials have done.

This viewpoint should be the alternative which you accept. It should be easy and agreeable to accept because the anatomy of selling is a simple, logical, easily understood process. If you do not guide your prospects through these five steps, you must rely continually on war to sell your goods for you, or see substitutes again take your markets. There is no other answer!



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What the **INDUSTRY** ***NEEDS*** Most

By Lee Robinson

WHAT the industry needs most is becoming daily more and more important to each of us. Just what is facing our industry when the so-called normal conditions return? When all materials and products have to sell on a competitive maket?

Of course, the general public has a great uneasiness as to what is going to happen, but almost every day we hear people in the lumber industry say that our condition can only be compared with one who nears the edge of a precipice over which there is no escaping a fall. I must say that I am unable to avoid such a feeling myself!

It has long been time for us to take stock of ourselves and wake up. During the 1930's, this industry never did recover from the depression, and when the war boom started in early 1940, we were at just about the very lowest ebb in profits, production, prices and everything else, when compared with almost any other industry.

Everyone knows the reason. We lost too many of our markets. For instance, hardwoods lost all the automobile body business as well as many other markets, and softwoods lost comparably. Various pulp and fiber materials took tremendously from all lumber, including the loss of many of our hardwood low grade outlets. Our timber was deteriorating in quality and at the same time, it was becoming increasingly difficult for the consumer to find many items of lumber which he badly needed. In addition to this, much of the lumber used was of the wrong species along with poor technique in using it. The result of this was a great deal of rot and deterioration in many important products—for example, automobile bodies and more recently station wagon bodies.

On the other hand, most competing products—we like to call them substitutes—have been vastly improved by research. Just consider what steel has accomplished in lowered cost of thin sheets, in pressed shapes of all kinds, stamping, etc., which enables the present low-priced quantity automobile body production.

The same condition prevails with almost every other competing material, and in nearly every line in one way or another. Also, we are constantly being ruled out of buildings by fire safety specifications.

I do not believe that many of us realize the great opportunities that research has opened before us, if we will just exploit them. Even though the shots have certainly been scattered too much, the following are definitely emerging as not mere possibilities, but as certainties in some cases and as probabilities in others.

(1) Fire resistant lumber. This is probably furthest away of any of the

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Mr. Robinson is president of the Mobile River Saw Mill Co., Mt. Vernon, Alabama. This speech was presented at the recent Annual Convention of the Southern Hardwood Producers, Inc., held at New Orleans.

great objectives. However, it is being done today, but is not yet perfected enough to obtain an underwriter approval as fire proof. The cost is also too high.

(2) Decay proof and insect proof lumber. This is practically perfected by use of several different formulas. The cost probably is still on the high side for some ordinary utilizations.

(3) 100% perfect water proof, heat proof lamination, endwise, edgewise and sidewise. This appears accomplished, but the cost is too high, except for very high priced usage such as ship timbers.

(4) Dimensional stability. Great strides are being made in this important field.

All of the above may sound more or less vague. But it is not vague if you will review the progress in general of research accomplishments in other products. Invariably, after a way is found to accomplish certain objectives, the final part is to take the bugs out and then to find ways and means to get the costs down and get the product into production.

After this, of course, another big job is to show the public what we have, but this is not by any means impossible.

If such a program is worked out, and there is no reason to doubt that it can be, at least in large part by enough of a concerted effort, there would be no end to our markets! A hotel could be built largely out of wood, and would be better insulated, less affected by expansion and contraction, just as strong and durable and would cost less. Truck bodies, implement parts, outdoor furniture and everything else for outside use you can think of, could and would be made of wood. A sample truck body is already being made completely of decay-proof wood, just as a demonstration. Our low grade hardwoods could be laminated into any size or shape needed. Such timbers would be the strongest and stiffest ever produced! Just think, the finest all heart timber ever grown would not compare with what we can now produce, and it can also be made fire resistant.

Why has such a program not already been put into effect? This is a long story, but it is not lack of work or lack of ability. TECO, Timber Engineering Company, has a fine staff which has accomplished wonders. The Forest Products Laboratory, private laboratories and individuals have made many worthwhile advances and are now working on many others—much of the work being done is on the four objectives given earlier in the article.

However, with the exception of the government Forest Products Laboratory, the research is financed largely by some particular group who is seeking some definite objective. For instance, TECO has been directed to spend much of its time and money on such things as the tie program, Milpak and other low grade lumber projects, utilization of waste and many other things, all excellent and well worthwhile, and most of which should not be abandoned. Do not think either, that I am criticizing our committees who have handled our research. They have done an outstanding job and we owe them a great debt.

What I do mean is that we should now make an emergency drive to capitalize on what they have accomplished. That we should take these projects which could revolutionize this industry and put them into effect before it is too late!

Today the government actually pays 52% of what some corporations may spend on research and about 80% as applying to those others who are in the excess profits bracket. Individual companies are about in the same position. How long this will continue, we do not know.

There is no disguising the fact that such a program will take plenty of money and plenty of work by plenty of people. First, any research is a slow and painful process of trial and error and of thorough tests. Next the product must be put into production and the processes and techniques of production figured out. Last, but not least, of course, is demonstrating the products and promoting them to a skeptical public.

How can we accomplish all this? I believe that it means a separate organization exclusively for this purpose. Our present associations have no more staff nor finances than they need to carry on their present programs which are all important and should not be slighted. I think this should be an organization from the grass roots both in finance and in personnel. It should really be a challenge to our young men. We are now blessed in having some very fine talent among them in several different generations. An organization should be established over the entire hardwood industry in all its branches. Furthermore, we recommend that serious consideration be given to enlisting the cooperation of the softwood industries, as the interest is certainly mutual. A competent staff of the best talent in the U.S.A. should be retained, regardless of the cost.

A better method of effectuating such a program may well be devised, but certainly something should be done immediately! It may be too late already, but I do not think so. We will never again have an opportunity like the present! Not only are we in a position to pay the cost almost painlessly, but also nearly all the competitive materials—substitutes, if you wish—are in a more or less scarce supply.

We have now for some years—and for the first time—enjoyed the same kind of prosperity which other first class industries have. We have not only had much more for ourselves, but better yet, we have been in a position to improve the lot of our staffs and our employees and to help our communities. Those of us who were in the lumber business prior to 1940 can best appreciate how good it is.

Let's keep it! It is much too good for us to sit down and let the industries who have used their opportunities take it away from us when real competition arises.

The End

SOUTHERN HARDWOOD PRODUCERS

The Roosevelt Hotel at New Orleans, La., was the site of the annual meeting of the Southern Hardwood Producers, Inc. Jim Heatherly, secretary-treasurer of the organization and his program committee put together a very fine meeting.

The convention was opened by President G. H. King. Lee Robinson spoke on "What The Industry Needs Most;" P. K. Seidman on "Current Tax Problems" and George Fuller of NLMA on "The Confused Washington Picture." Election of officers and a business session of the board of directors were held in the afternoon.

The following day, three other speakers presented addresses. E. J. Lauesen spoke on "The Anatomy Of A Sale;" Leonard R. Steidel on the "Oak Wilt Research Program" and Carl Rishell told about "New Developments in Army Truck Bodies, Ammunition Boxes and Marine Laminating."

New officers are: president, W. M. Hallett, Jr., Mobile, Ala.; vice president, Charles A. Ransom, Haraham, La.; and Jim Heatherly, secretary-treasurer.

A hypocrite is like a pin—points one way, heads the other.

Atlas 10" FLOOR SAW

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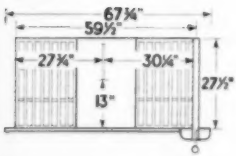

SOLIDLY built, with the precision and rugged strength of a metal working tool, this Atlas 10" saw can add new versatility and new production speed to your shop. It handles large stock easily — the ground grey-iron table and extensions give plenty of support for big boards, panels.

On small work, the quick-adjusting rip fence with vernier control can save many valuable minutes every day. Get all the details about this perfectly designed production saw. Send for latest catalog.

Quick-Set Rip Fence
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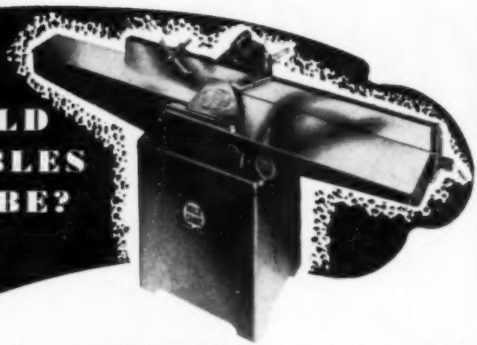
DEPENDABLE QUALITY TOOLS SINCE 1911

HOW LONG SHOULD JOINTER TABLES and FENCES BE?



In jointer design there is a definite relationship between fence length and table length. It is generally conceded that a jointer is as good as it is long. Lengthening of a table alone is not sufficient to increase the scope of use of a jointer. The fence, likewise, must be extended and should always be as long as the infeed table plus 60% of the length of the outfeed table and **ABSOLUTELY RIGID ALONG ITS ENTIRE LENGTH.** To assure accuracy and avoid work spoilage, tables and fences furthermore must be absolutely flat and straight, **AND STAY IN THAT CONDITION** regardless of abnormal operating conditions.

BOICE-CRANE JOINTERS

have the longest fences of any 6" or 8" jointers, the longest tables of any 8" jointers, and afford the biggest values in any 6" and 8" jointers. They are rugged enough for planing mills and accurate enough for demanding cabinet makers.

All Boice-Crane jointer head bearings stand speeds up to 5500 r.p.m. Tables are simultaneously ground flat and parallel to closest limits—stay flat. Boice-Crane offers the only long-table jointers with full-length, front-adjusting, double-locked fences. After the fence has been double-locked, depth adjustment is made without disturbing the locked fence. When rabbeting, the exclusive guard on all Boice-Crane jointers stays on the machine—simply turn and swing out of the way.

NEW, WELDED, ALL-STEEL LONG-TABLE MODELS

Permit strength, permanent accuracy and alignment impossible with bolted-up cast iron construction. Using steel (3 times stronger than cast iron of same thickness), tables are extended without increasing width, thickness, weight or floor space. A comparable cast iron jointer would weigh more than twice as much. Tables undergirded full length. There are no springy overhanging tables to spoil heavy work. Steel is actually 2 to 3 times stiffer than iron. The entire infeed table is a rabbet arm. They are the first jointers with adequate support for narrow rabbeting on wide stock. Quick, positive, micrometer-accurate knife setting. All knives cut the exact same depth within .002" to .003"—setting a new standard for perfect work without chatter marks . . . better finish . . . smoother operation. 3¼-inch diameter head (3⅝-inch cutting circle), 20% larger than conventional 6-inch jointers. Improved cutting angle. Depth of cut control, table locks, direct reading depth scale and switch easily used in a comfortable, normal operating position. New rotor-on-cutterhead or V-belt drive is optional.

THE BOICE-CRANE NO. 1400 LOW-PRICED 6" JOINTER

Has cast iron table and base. Loaded with features not found on others in its price range. Its 36" tables are up to 6" longer than others; the fence extends practically full-length of the tables (35" long) and has exclusive front and rear lock rigidity. The larger 2¾" diameter cutterhead affords a freer cutting "rake-angle" to knives, for a chatterless and much smoother shearing cut rather than the chipping and chattering cut common to smaller diameter cutterheads.

Boice-Crane offers a complete line of job-rated jointers:

Model No.	Size	Without auxiliary feeding aids, recommended for stock lengths to	Length being a factor, recommended for stock sizes to	Planes boards and panels to	Fence	Depth of cut	Cutterhead Diameter	Cutting Arc Diameter
3400	8"x84"	8 ft.	8"x8"	16" wide	66"x4"	5/8"	3¼"	3⅜"
2400	6"x60"	6 ft.	6"x6"	12" wide	48"x4"	½"	3¼"	3⅜"
1400	6"x36"	4 ft.	4"x6"	12" wide	33"x3⅛"	⅛"	2¾"	3"

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Basic Principles in KILN DRYING Lumber

By Harry D. Tiemann

KILN drying of lumber should not be looked upon as simply a trade—it is an art! Kiln drying requires intelligence and knowledge of species as well as experience on the part of the operator. It also requires proper apparatus and equipment. There is, of course, a vast difference in this respect as to the kind of wood to be dried. Properly handled, most species can be dried in a kiln from green lumber with less injury than occurs in slow air drying of the same material. This is especially true of refractory kinds. By "refractory" I mean wood in which the moisture moves with great difficulty, because the cells are impervious in the sense explained in a previous article ("What is Collapse?" Febuary issue). In other kinds of wood water moves easily by capillarity, as the cells are quite pervious. Yellow birch is an example of this. The sapwood of most species holds true to this principle.

Drying Sapwood and Heartwood

The difference in this respect is well known by the sapwood and the plain (not the figured) heartwood of red gum. It affects both the drying and the impregnation with preservatives. This is clearly shown in Fig. 1, which is a photograph of cross sections of two red gum planks two inches thick, one being all sapwood and the other all heartwood. Both were flat grain and of approximately the same rate of growth; so the only significant difference was in their perviousness to water movement. The planks had been kept under water ever since they were sawed from the log. They were kiln dried together under identical conditions. The difference in the drying became evident at once. The run was started at 136°F. dry bulb and 130°F. wet bulb. The surface of the sap plank remained moist for a number of days, due to the capillary movement of the free water. The heart plank, on the other hand, showed a sharply defined surface zone of dry wood about 1/32" deep when a section was cut after only eight hours' drying. This was because water could not flow by capillarity to replenish what dried from the surface.

Moisture gradients obtained by cutting sections at various stages of the drying are shown in Figures 2 and 3. (Gradients were obtained at 12 periods of the drying, but only 4 or 5 are reproduced in the diagrams for clearness.) By comparing the curves of cor-

Fig. 1 Comparison of manner of drying between heartwood and sapwood under identical conditions. Red gum planks 2" thick after kiln drying together 12 days.

responding dates the difference in the manner of drying is strikingly evident. Drying began on September 2. The curve for the first day of drying, on September 3, is not shown on the heartwood specimen as only the extreme surface had dried any, but the sapwood curve on that date shows a reduction of moisture clear through to the center. Its initial moisture was around 140%.

The sections shown in the photograph, Figure 1, were cut September 13, after drying for 11 days. The curves for September 14 closely represent these sections. It will be seen that the center of the heartwood piece still contained 138% moisture whereas the free-water had all gone from that of the sapwood, and its gradient was of the normal shape for wood below the f.s.p. (fiber saturation point).

Another important consideration here is the evident fact that in the sapwood piece from this point on shrinkage takes place throughout the entire section clear through to the center; whereas in the heartwood no shrinkage can occur in the wet zone, which is far above the f.s.p., but shrinkage has occurred at the surface and inward to the border of the wet zone. This is indicated by the checks shown in the photograph. The dark area, not retouched, shows the presence of the free-water. By September 28, the sapwood piece was thoroughly dry, but the heartwood plank still had free-water in the center—over 70% moisture. Complete drying of this plank would eventually cause a reversal of stresses due to the extension "set" of the surface and shrinkage of the inside. This would tightly close the checks and induce collapse and honeycombing in the center, especially if the temperature were much increased.

Still another difference between these two planks is that the temperature inside the sapwood measured close to that of the wet bulb for several days thus indicating capillary flow of the free-water; whereas that of the heartwood plank reached the dry bulb temperature almost immediately.

Impervious Wood

A striking example of refractory

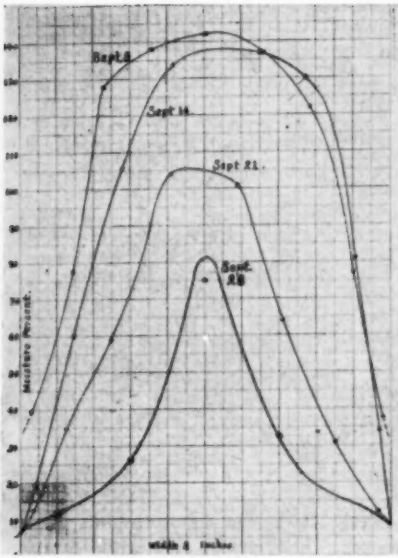


Fig. 2. Moisture gradients of the heartwood plank at progressive periods of drying.

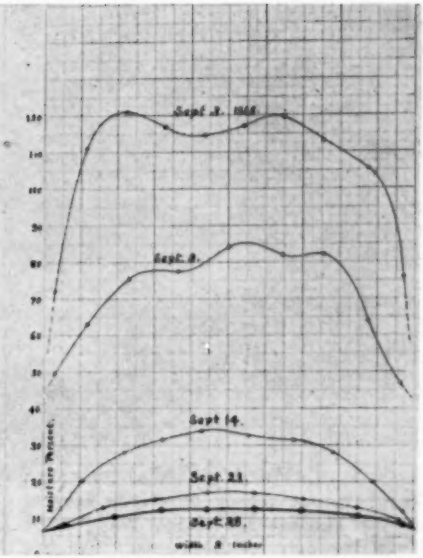


Fig. 3. Moisture gradients of the sapwood plank at the same periods of drying as in Fig. 2.

wood is that of a Central American species locally called "Cedro Espinoso" (bombacopsis quinatun) resembling black walnut. A cross section was cut from an edge grain board 7⅝" wide and ¾" thick so as to form a strip 7⅝" long (radially), ¾" tangentially and 1" parallel to the grain. A hole was drilled in one end to a depth of 2" and a piece of ⅛" pipe screwed in tightly. After filling with water, so as to exclude any air pockets, this was attached to the water main at about 75 lb. pressure. Although left continually under this water pressure for over a month, no water appeared to get through for all the surfaces remained dry. This was true in spite of the fact that it need travel only 5/16" longitudinally or ¼" tangentially of the grain to reach the surface! Moisture was practically sealed up in this wood. Common cork is, of course, also impervious, having been grown by nature to form a wonderful insulation to water and heat as protection to the sap in the living tree. Such woods are obviously very difficult to dry.

Importance of Fundamentals

I have taken time to explain these differences in the manner of drying in different kinds of wood, as it is essential to thoroughly understand them before anyone can become proficient in kiln drying lumber.

There are of course many species which can be easily dried without expert knowledge, as is the case with sap gum, some conifers, birch, basswood and most previously air dry material.

Thoroughly air dry lumber, if it has not already become seriously checked in the yard, is generally easy to dry. By "air dry" I mean wood which contains no free-water in the center. In

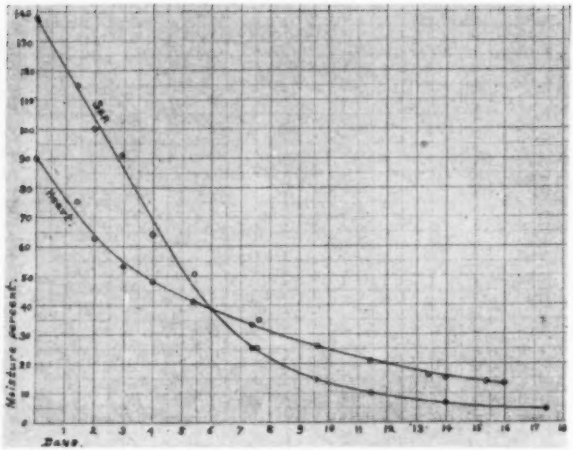


Fig. 4. Rates of drying together under identical conditions between sapwood and heartwood inch thick boards of red gum. (Not the same material as the other figures.)

the case of air dry lumber as compared to green, one reason why it is easy to dry is because shrinkage takes place clear through to the center. Lumber containing moisture above the f.s.p. cannot shrink in the center until all the free-water has gone. Severe stresses are thus set up—first with tension on the surface, inducive to checking, with corresponding compression in the center. This produces an extension "set" on the surface which subsequently changes to compression, with tension internally when the inside dries below its f.s.p. This is the "reversal of stresses" previously mentioned.

What Is "Set"?

It is well to bear in mind that the only significant consideration in the prevention of injury in the drying of lumber depend upon the internal stresses set up in the drying process. Wood is plastic, especially when hot and wet, and when it dries under stress it takes on a "set" according as to whether the stress is that of compression or of tension. If it dries under tension its shrinkage is less than normal; if under compression it is greater. This peculiar set is not simply a distortion of the fibers, but appears to be an inherent displacement of the molecular arrangement of the submicroscopic cellulose fibrils in the cell walls. Furthermore, as wood dries below its f.s.p., it greatly hardens. Were any one of these three phenomena absent—shrinkage, set, hardening—kiln drying would be as easy as "rolling off a log." There is not space here to go into an explanation of these phenomena however, and we must accept them now simply as well established facts.*

Summary

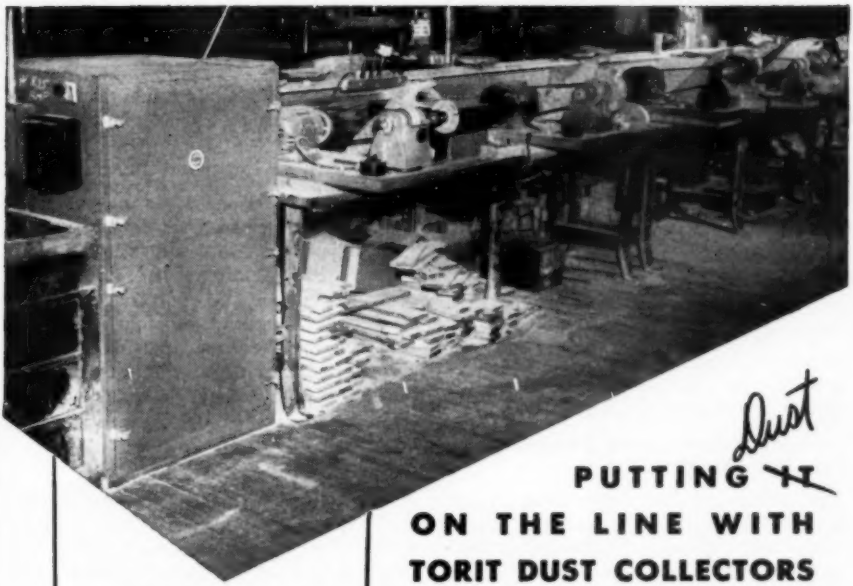
The significant principles I have endeavored to make plain, are briefly these:

(1) The great behavior difference in drying between pervious and impervious woods.

(2) The capillary movement of the free-water in sapwood and in pervious species, as compared with its sealing up and slow diffusion in impervious material.

(3) The danger of collapse in the

* See WOOD TECHNOLOGY by Tiemann, 3rd edition 1951. Chap. 6, "The Structure of the Cell Wall". Also pages 163, 164, "Explanation of Set."



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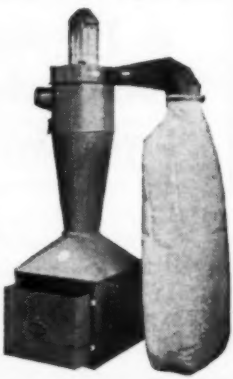

Torit also manufactures a line of cyclone type dust separators. These can be ordered with an after-filter, as shown above, which permits recirculating the cleaned air within the plant.

heartwood of many impervious species during the removal of the free-water from completely filled cells.

(4) The phenomenon of "set" and its effect upon internal stresses.

(5) Difference in the way shrinkage takes place between wood containing free-water in the center, green lumber, and air dry material already below the f.s.p. in the center.

(6) Internal vacuum produced by the evaporation of the free-water in drying.

(7) The temperature of pervious wood is close to that of the wet-bulb during the drying of its free-water.

(8) Wood hardens and strengthens as it dries below the f.s.p.

(9) Were any one of the three factors of shrinkage, set, or hardening, absent, there would be no difficulty in the drying of any wood except where collapse is imminent in certain completely saturated impervious kinds.

(10) Pervious woods dry more rapidly than impervious kinds under the same conditions. A high circulation of air is very effective in drying the former, but much less important in the latter.

For these reasons it is not always feasible to prescribe fixed drying schedules which any one could follow. Much must often be left to the knowledge and judgment of the operator, especially in the handling of new kinds of material for the first time. Remember, internal stresses are the important consideration.

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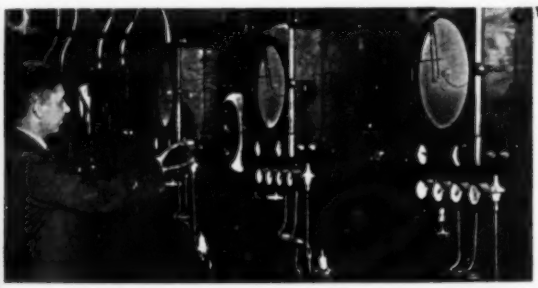

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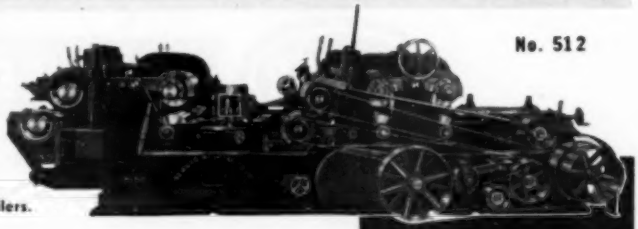

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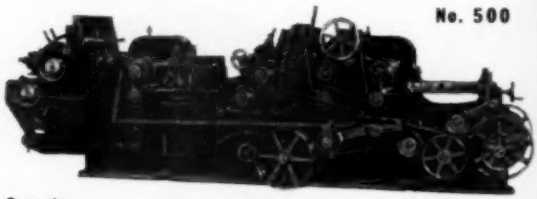

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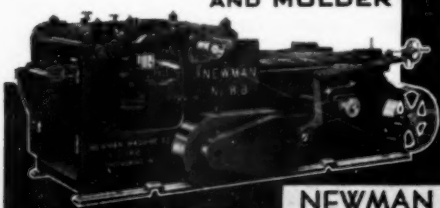

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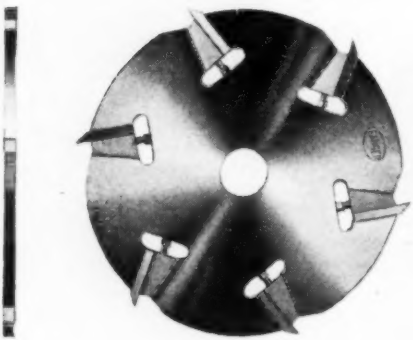

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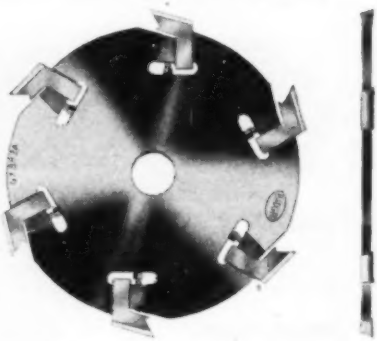

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HARDBOARD

Used in the Furniture Industry

By Armin Elmendorf

Elmendorf Research, Inc., recently completed a survey of the furniture industry. Purpose of the survey was to explore current uses of hardboard—a number of hardboards are available. One of the oldest is Masonite and most of the specifications that have been developed to date are those developed for use of Masonite hardboards.

FINE woods have been used for furniture throughout recorded history, and the public demand for wood will no doubt continue, but there are many large surfaces in furniture where a natural wood surface is not required and where the advantages of hardboard can therefore be introduced. The unique physical properties of hardboard are so outstanding that many millions of feet of this product now find their way into the construction of furniture each month.

Large exposed panels that have been made of plywood heretofore are now being made of veneered hardboard. Its use in place of veneer for cross-banding in table and desk tops has significant advantages that are now being explored by a number of furniture manufacturers. Numerous desks have been made in which hardboard was used in place of veneer for cross-banding, and these are now under observation. This article will, therefore, discuss the use of hardboard for: (a) panels that are varnished, enameled, or left unfinished; (b) the cores of veneered panels; (c) cross-banding in 5-ply panels having lumber cores.

Properties of Hardboard

The term "hardboard" is now generally used to refer to high density wood-fiber boards made by coalescing wood fibers in a hot plate press. They differ basically from the older laminated raw wood-fiber boards in that they are harder, free of laminations, more scuff-resistant and dimensionally more stable. The fibers are held together by chemical bond, by hydration, or by means of synthetic resin binders.

Most hardboards are made of wood fibers that have undergone some special

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Mr. Elmendorf is president of Elmendorf Research, Inc., Chicago, Ill. This article was originally presented at a regional meeting of the Forest Products Research Society and is reprinted with permission.

Placing face veneer on a hardboard core in a Grand Rapids furniture factory. A single opening press is used.

treatment, as in the explosion process of Masonite, to cause them to bond together under heat and pressure without the use of a binder. In the Masonite process some of the lignin in the wood becomes reactive and serves as a binder.

Some hardboards are made of wood particles that have been given a coat of a synthetic resin binder. When a thick mat of loosely felted coated wood particles or granules is pressed between hot plates under heavy pressure, a particle to particle bond is achieved that gives the resultant board properties similar to those of a wood-fiber hardboard.

The density of hardboard ranges from about 0.8 to 1.2. The expansion in thickness resulting from 24 hours of soaking in water is far less than that of raw fiber laminated boards.

Hardboards have substantially the same properties in all directions in the plane of the board, and there are no zones of high and low density within the board as in natural wood. The minute dimensional changes that take place due to moisture changes are uniform in both the length and width directions, and are far less than the shrinkage or expansion of wood across the grain.

The bending strength of hardboards, technically known as "modulus of rupture," ranges from about 4,000 to 10,000 lbs. per sq. in. Typical hardboards made by the wet process have a modulus of rupture of 5,000 to 6,000 lbs. per sq. in. Tempered boards may have a modulus of 10,000 lbs. per sq. in. and smooth two-sided boards may be even stronger.

Hardboards also differ from laminated raw wood-fiber boards in that they retain the greater part of their strength when soaked in water.

Hardboards can be fabricated with ordinary woodworking tools, and they are readily nailed, screwed or glued in place. Carboloy tipped planer and saw blades are preferred to increase the working life of the cutting edge.

The hardness of hardboards exceeds that of most commercial hardwoods, and as they have no grain, they do not split or splinter.

Most hardboards 1/8" in thickness can be readily bent with conventional bending machinery in which the board

is bent around a hot tube to the desired radius. No difficulty is experienced in bending the 1/8" board to a radius as small as 2".

Manufacture

Most hardboards are made by depositing or felting the fibers on a moving wire-screen to produce a thick wet mat which is pressed between rolls to squeeze out some of the water and is then pressed in a hot plate press. A wire-screen is used in each press opening to facilitate the escape of steam. One surface of the board generally reveals the impressions left by the screen. The other surface, being in contact with a smooth plate in the press, is smooth.

The binding action between the fibers on the screen side at the board surface is not as firm as that between the fibers in the body of the board. Consequently, a thin layer of fibers on the screen side must be removed if the full strength of the board surface is to be obtained, as when hardboards are used for cross-banding. The screen impressions can be removed by planing or sanding.

Commercial hardboards are also furnished with a supplementary oil or resin treatment referred to as "tempering." The tempering process further hardens and strengthens the board so that where maximum strength, surface smoothness, dimensional stability and water-resistance are desired, the tempered board should be used.

Sizes and Thicknesses

Most hardboards manufactured in the United States are made in one width, namely 4', and from 8' to 12' long. When lengths between 8' to 12' are required and the board is made only 12' long, the resultant trim or "shorts" are sold for miscellaneous uses where small sizes are satisfactory.

Hardboard panels going through the glue spreader.

Hardboards are commercially available in four major thicknesses, namely 1/8", 3/16", 1/4", and 5/16". If 1/8" boards are sanded to remove the screen back, they become 1/10" thick.

Finishing Hardboard

Because of the smooth, hard surface, and the freedom from annual ring structure of natural wood, hardboards lend themselves eminently well to lacquer and enamel finishes. Such finishes are generally applied with a spray gun, although they may also be applied with coating rolls. The boards also lend themselves to certain mottled lacquer finishes.

Hard, decorative synthetic resin sheets, of the phenolic and melamine resin type are readily bonded to hardboard surfaces using standard procedure as for bonding to plywood. Urea resin and casein glue are generally used for this purpose, and the pressing is done at room temperatures.

Lithographic finishes are being applied to hardboard surfaces on an extensive scale. Such finishes are ob-

tained by a printing technique in which the pattern to be printed on the hardboard surface is picked up by means of a gelatin roll from an etched metal plate or roll carrying the ink. Many wood reproductions as well as marble and fabric reproductions are now being applied to hardboard in the furniture and allied industries.

Uses of Hardboard Without Veneer

As hardboards cost less than plywood, and as they have a number of advantages over plywood such as superior flatness and greater hardness, they are being used on an increasing scale to replace thin plywood in the furniture industry. For most uses, the 1/8" thickness of standard hardboard is satisfactory. A very large footage of hardboard of the standard type and thickness which is not veneered now goes into: backs of case goods, dust stops between drawers, drawer bottoms and mirror backs.

Hardboard Cores

Hardboards are now being used extensively for the cores of 3-ply panels to replace the veneer inner ply. Sometimes veneers are applied only to one surface, but more often to both. The standard veneer thickness of 1/28" is generally used, and most of the face veneers used are sliced. The preparation of the face veneers is the same as in the manufacture of plywood. The edges are jointed and then brought together by taping or by edge gluing in a splicing machine. The veneers may be bonded to the hardboard core in either a hot plate press or in a cold press, using urea or phenolic resin adhesive in the case of hot pressing and cold setting urea in the cold press.

When a hot press is used, the adhesive manufacturer's specifications should be followed in respect to consistency and amount of adhesive, time under pressure and temperature. In order to obtain firm gluing over the entire panel, both the core and the face veneers must be uniform in thickness. When the core has been planed to remove the screen marks from the back, its thickness should be accurate to .005 inch over the entire area. As the core in a given panel having a hardboard core is of one piece, the problem of differences in thickness in different places in the panel—so common in veneer cores—is eliminated. Poor bonding resulting from the differences in veneer thickness is therefore non-existent.

The pressing temperatures for urea adhesive are lower than those used for adhesives of the phenolic resin type. Panels made at relatively low temperatures, that is temperatures ranging from 220° to 250°, are inclined to be flatter than those made at temperatures of 300° to 350°. Therefore urea bonding is generally preferred.

A common source of warping found in plywood made with a veneer core is eliminated through the use of hardboard cores because the stresses set up by core shrinkage are eliminated. Unless the grain of the veneer core is exactly at right angles to the face grain, some warping is likely to ensue because the stresses introduced by shrinkage are unbalanced. No such warping can take place with a hardboard core because it has the same properties in all directions.

It is customary and advisable to stack the hot panels immediately upon removal from the press in a solid pile so that they can cool gradually. By so stacking and by covering the stack with a panel there is no loss of moisture from one side of the panel to the other side during cooling. Therefore there is no imbalance in the shrinkage stresses set up by the face veneers. It is desirable to retain the original hygroscopic moisture in the panel during the cooling

period to prevent shrinkage of the face veneers.

The moisture content of the hardboard core as furnished by the manufacturer is generally satisfactory for veneered panels. It may be about 5% to 6%, and should not deviate widely from this in order that the moisture content of the completed panel be near the equilibrium moisture of the panel in use. The film type of phenolic resin adhesive finds wide application in the furniture industry because films do not introduce moisture into the panel. It is also important that the moisture content of the veneers on the opposite sides of the panels be the same, so that there will be no undue shrinkage or expansion of one side relative to the other. An imbalance of shrinkage or expansion of the face veneers will cause warping.

While the furniture industry frequently uses a fine cabinet wood on the face side of the panel and a less expensive wood on the back side, it is desirable that the physical properties of the face veneers and the back veneers be about the same, and that their thicknesses also be the same. If 1/28" mahogany or walnut face veneers are used for the face, the back may be of poplar and it, too, should be 1/28" thick. Furthermore, to obtain the flattest boards, the grain of the veneer on the face side should be substantially parallel to that on the back side.

Considerable experience in the furniture industry in the use of hardboard for the cores of veneer panels has showed that such panels are flatter than 3-ply plywood of the same thickness. They are flat for the reasons given above.

While some manufacturers are successfully using hardboards for cores without removing the screen marks from the back, for the best bonding the screen marks should be planed or sanded off.

Veneered hardboards like the unveneered hardboards are being used for the backs of case goods, for drawer bottoms, side panels and mirror backs.

Extensive application has also been found for hardboards with veneer on only one side. Such boards are being used for the backs of case goods with the veener side out. Because of the unbalanced construction, they are not as flat as boards veneered on both sides. However, when film adhesives are used and the veneer moisture is controlled, commercially flat panels are readily obtained. If not perfectly flat before installation, they are straightened out and satisfactory results are being obtained when the panels are fastened on the four edges. When hardboards with veneer only on one side are used for drawer bottoms, it is customary to place these boards with the veneer side up, exposed to view when the drawer is opened.

If veneer is to be applied to only one side, its moisture at the time of gluing should be below equilibrium moisture rather than above. This will be below about 6% so that when in use there will be a slight tendency for the veneer to expand rather than contract.

While the shrinkage stresses set up by veneers 1/48" or less in thickness are less than those set up by standard 1/28" veneers, and their use could therefore be theoretically justified, experience has shown that very thin veneers generally cost as much as the 1/28" thickness. This is because they have to be specially cut. It is common practice to use the latter thickness because it provides more wood for drum sanding than do very thin veneers.

Face veneers as thin as 1/64" can be readily sanded on a belt sander, but most operators prefer not to incur the added cost of belt sanding.

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While the per sq. ft. cost of hardboards may be higher than that of core veneers, manufacturers contend that there is actually little difference in cost between the two products. When veneer trim losses and cost of fabricating and edge-gluing veneer are taken into consideration, there will generally be little difference in the total cost.

The superior panel flatness, greater hardness, and the uniformity of results recommends the use of hardboard in place of veneer for the cores of 3-ply panels.

Hardboard Cross-Banding

There has been considerable discussion in the furniture industry in recent years in regard to the use of hardboard in place of conventional veneer cross-banding, and no less than seven major furniture manufacturers are now exploring this subject experimentally. These firms have all made table tops or desk tops with Masonite tempered hardboard cross-banding for observation and test. Some of these have now been in use from two to three years and eminently satisfactory results are reported.

The results seem to justify the following conclusions:

a. The tops remain flat in use and evidence of sunken joints is rare.

b. Lumber cores containing sound knots and even knot holes can be used, whereas such defects telegraph through when veneer cross-banding is used.

c. One manufacturer reports that he is able to use short blocks of wood end to end in the core without showing end joints thru the finish.

d. The greater thickness of the hardboard cross-banding permits the use of thinner lumber for the core. The board foot cost of ¾-inch lumber is less than it is for 1-inch lumber. It appears that a 13/16-inch overall thickness of panel can be obtained with ¾"

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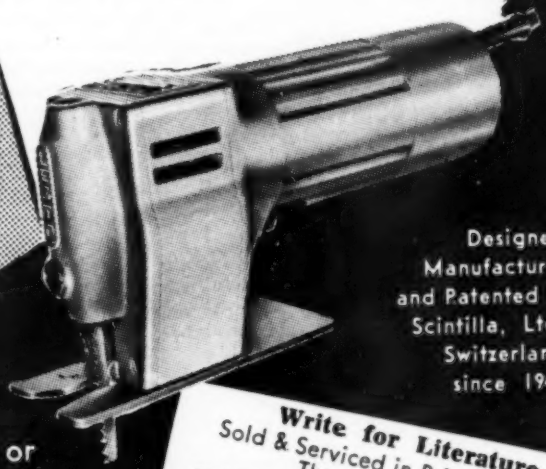

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lumber when the core is dressed down to 9/16", and 1/10" hardboard is used for the cross-banding.

e. Waviness in the finish, so often noticed, due to veneer cross-banding is eliminated. Differences in density of the veneer cross-banding in adjacent areas often telegraph through the finish causing a wavy appearance. This defect in fine furniture finishes has no relation to the waviness caused by sunken joints in the core. It is just as important to eliminate the former as the latter, and the use of hardboard cross-banding seems to achieve both.

f. The hardness of hardboard cross-banding reduces damage from surface bruising.

Uniform thickness of cross-banding is important in order to obtain firm gluing contact over the entire area. This requirement is met automatically when the screen marking on the back of the hardboard is planed off.

Adequate time must be allowed between the application of adhesive and pressing, to avoid starved joints, if a hot plate press and liquid adhesive are used. Adequate time must also be allowed for equalizing the moisture in the core after edge-gluing and before planing. The most exacting manufacturers allow a week.

Narrow strips in the core produce flatter panels than do wide pieces, and edge grain lumber should be used where possible.

While hardboard cross-banding costs more per sq. ft. than does veneer, cost estimates show that the economies introduced more than compensate for the differences in original hardboard and veneer cost. The following economies are obtained:

a. A lower-grade of lumber containing knots can be used. Even small open holes do not show thru the finish.

b. Thinner lumber can be used. Such

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lumber costs less per board per foot. Wood is saved due to reduction of the core thickness.

c. The trim waste of veneer is eliminated.

d. All the labor of edge jointing and splicing veneer is eliminated.

In view of the reduction of sunken joint trouble, the elimination of waviness in the finish caused by the annual ring growth of veneer cross-banding, the improvement in resistance to damage from indentation, the possibility of using lower cost lumber in the core, the elimination of veneer waste, and the elimination of the labor of preparing veneer cross-banding, it would seem that the use of hardboard cross-banding will increase as its advantages become more widely known.

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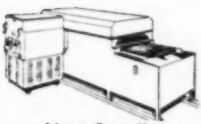

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A free new booklet explaining the best way to store coated abrasives in order to prevent deterioration and improve length of service has just been published by Armour and Company, Coated Abrasives Div., Alliance, Ohio.

Since many plants always have large supplies of abrasive belts and discs in their storerooms, this information should be of great interest. Proper storage of abrasives not only reduces deterioration, the booklet explains, but also considerably increases the length of service of any belt or disc.

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Fine Finishing Starts with STAINS

By H. H. Connelly

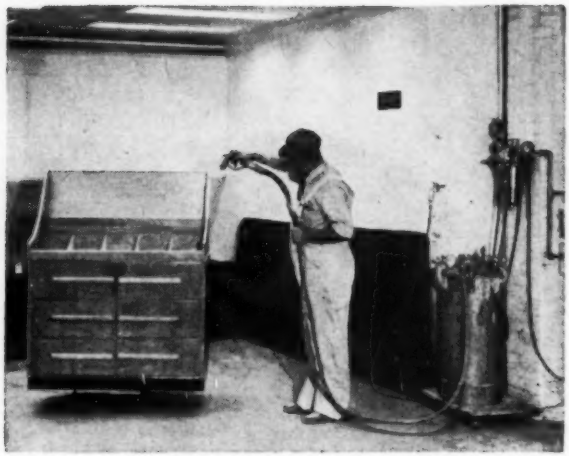
IN 1791 Thomas Sheraton's first edition of "Cabinetmaker's and Upholsterer's Drawing Book" hit the book shops of London, bringing up-to-date for the carriage trade the latest furniture styles. In that book Sheraton gave us the first real historical hint of how furniture stain would increase the beauty of the wood grain by the application of an opaque coloring.

Since the only known practice of finishing furniture was by the French polishing method, a laborious process of hand padding shellac and oil into the wood, Sheraton went to great length to describe the process (probably an added sales appeal). He highly recommended the addition of a little solution of alkanet root to the padding pouch to give a reddish shade to the finish.

We can easily understand the reason Sheraton did not recommend other stains; they didn't exist in the form of necessary opaque colors. There were surprisingly few natural colored pigments and even less synthetic for coloring furniture up until the end of the nineteenth century.

In fact, we are inclined to suspect the American Indian, if left undisturbed by Columbus, would have progressed to the point of decorating his birch bark canoes with a good wood stain instead of his crude pigment paint made of ground wood charcoal from the alder wood and white mineral diatomite from the bottom of lakes and calcined deer antlers and bones. He had already discovered red, green, blue and yellow. He produced red from roasting the fungus of hemlock, yellow from ocher or ground hemlock fungus; blue and green came from copper carbonate.

As far back as the Renaissance, Leonardo da Vinci, Jan van Eyck, Rembrandt and other great painters of the time had less than 40 pigmented colors to choose from. These they made



Applying stain to a display counter with a spray gun and pressure feed tank.

by their own carefully guarded secrets and carried the information to their graves. As a pertinent example of the slow progress made in stains and colors, white lead—a coloring pigment important at the end of the 17th century—held its own until only a few short years ago when titanium oxide was first introduced.

Many years after Sheraton's time, cabinetmakers turned to chemical stains for coloring their work. One of these was permanganate of potash and it is still used today by concerns making authentic reproductions. It is made by adding six ounces of powdered permanganate of potash to one gallon of hot water, and will produce almost all shades of brown by diluting or adding more chemical to the water when mixed.

Another familiar old recipe to the "musket-toting joiners" was made by adding four ounces of bichromate of potash to a gallon of water and wiping over the surface to reach a shade of brown.

Sulphate of iron was found to produce black and gray; nitric acid, sulphuric acid and picric acid were used to produce yellow shades on woods and undoubtedly removed the hide of the operator in many cases.

This type of stain is not too satisfactory because of the chemical change, part through burning, that imparted the color to wood. What the furniture finisher wanted was a dye, opaque and stable to light.

It was not until the development of the aniline coal tar dye industry, about the time of the Civil War, that the furniture finisher realized this ambition. As a result of this discovery, a great number of synthetic organic pigments with great brilliance and a wide range of hues were obtained—not as cheaply or as permanent to light as the natural mineral colors, however. In 1914 Beyer and Innerheiser in Germany stumbled onto the idea of combining dyes and complex inorganic acid to obtain improved resistance to light.

And things really started looking up in 1927 when De Dresback and Von der Werd hit upon a new metallic-organic blue pigment with a chemical structure akin to such natural dyes as complex chlorophyll which produced new groups of blue and green pigments known as phthalocyanines, gratifyingly stable to light, heat, alkali and acid.

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As a result of these developments in stains, the modern furniture finisher has an unlimited field for creating a beautiful, unique and appealing article for the market.

With modern flexible stain, it is also possible and practical to reduce the material cost of manufacturing an article by substituting stronger and less expensive woods in those places where rare beautiful woods would have to be used if matching stains were not available.

Poplar, gum and other native woods can be stained a perfect match for maple, more expensive mahogany, cherry or walnut, thus making possible a desirable grade of furniture to satisfy a much needed demand in the low price market.

In finishing distinctive mahogany furniture by high production methods, it is impossible to perfectly match the variety of wood colors which are as different (some only slightly of course) as the number of trees from which the wood was produced.

The old masters solved this by producing chests, beds, chairs or even whole suites of furniture from lumber cut from the same tree, carefully graded and stacked log intact for drying for future use.

Types of Wood Stains

Stains made from aniline dyes are generally divided into solvent classes: (1) water aniline; (2) spirit aniline; (3) oil aniline, depending upon their solvents and (4) non-grain raising stains made from water soluble acid aniline dyes dissolved in alcohols and heavy carbon chemicals.

All of the above stains can be secured in dry powder form and mixed by the user to suit the finish, or they can be secured dry mixed to a prescribed formula leaving only the job of adding solvents in the plant. In the earlier days the former method was almost entirely adhered to; consequently a profusion of colors flowed from the factory. Few finishing factories had laboratory control facilities for exact duplication.

You will find that in recent years the practice has entirely changed. Now we find with open stock lines, the necessity of consistently reproducing the same color requires exact methods, not only for mixing but for the raw materials. Thus we should always order by the stain control number.

Few realize that the simple ochers, burnt siennas, and umbers all vary in their intensity and color depending upon their source. When a definite shade is adopted, it can be secured repeatedly when ordering from the same supplier by specifying the control number.

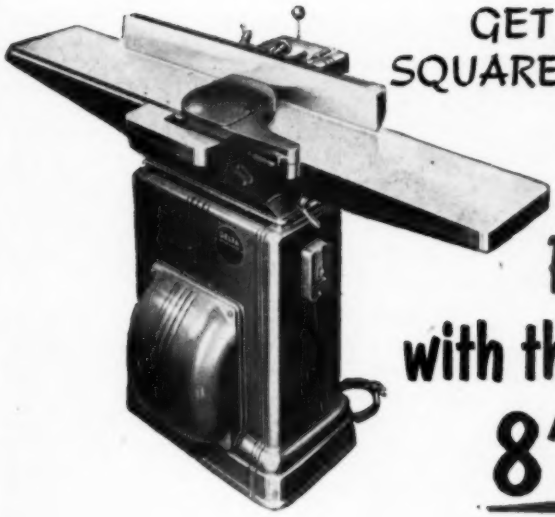
Water Soluble Stains

You will find a number of favorable advantages in this type of stain, but the foibles are numerous. Water stains produce good tone depth and are permanent in color when exposed to sunlight. When mixing water stains, the proportion of water to dry aniline powder is four gallons of hot water to the pound of powder. Intensity can be increased by adding more powder and weakened by adding water.

A second undisputed advantage of water stains is their relative low cost. Most finishing materials are costly because of the solvent. Water, being as abundant as rain in most regions, costs little as a solvent for wood stains with an additional realized saving in freight and handling.

The difficulty with this stain is the fact it is water—a particularly objectionable liquid to add to any wood that we have gone to extreme length and expense to get rid of.

Since wood has the disconcerting habit of fuzzing up when dampened, you have a problem of re-sanding (a bad practice when once stained for we



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will remove the stain) or tolerating the roughness till a time when you can sand safely. This additional rough grain is stubborn to fill.

Additional moisture through water stain calls for additional seasoning, longer periods of drying before wash coating and filling. In general it plays merry hob with a fast production schedule.

If water stains are used, forced drying is one means by which we can overcome this obstacle. The raised grain obstacle can be overcome to some extent by spraying the white wood with a glue size, dry and then sand before staining.

Oil Stains

Oil stains show favorable penetrating characteristics, probably more favorably than water, and produce an encouragingly clear tone. They do not produce the even staining as do water stains.

The rate of drying is controlled by the evaporating rate of the solvent. Since the solvent is mineral spirits, any number can be selected with a low boiling point. However, as a general rule, those with high boiling points like kerosene are relatively cheap; low boilers such as gasoline and V.M.P. naphtha are more expensive.

You can secure the various concentrated colors ground in oil and mix your own stain. You will find it is surprisingly easy to bring them into solution with the proper solvent and thinner. An alternate practice is to buy oil soluble aniline and mix with a thinner.

You will recall oil aniline is a synthesis of the coal tar industry and as such it is one of the principal sources of stains for the furniture industry.

The general practice is to first dissolve the pigments with benzine or turpentine and cut to the desired shade by diluting with a suitable thinner.

There is this important difference in the use of oil stains and spirits or water stains. Applied identically, either spray gun or brush, they must be wiped with waste or rags after flashing. Two points in the technique of wiping are important: (1) The wiping interval is important in obtaining the same consistent shade; (2) also the degree of pressure exerted by the wiping cloth in cleaning the surface. Hard, uneven pressure will leave a streaked surface.

Non-Grain Raising Stain

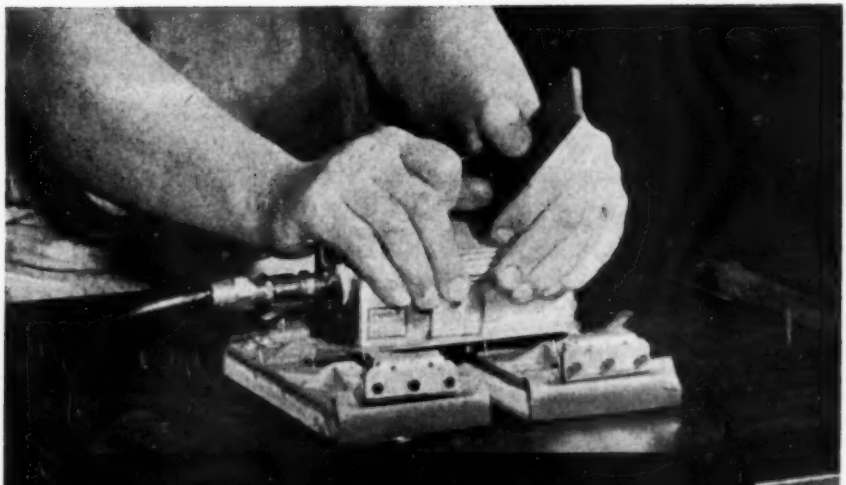
These stains probably more closely approach the furniture finisher's conception of perfection than any previously developed. They are stable to light, displaying the enduring qualities of water stains without the unmanageable habit of raising the wood fibers. They are non-bleeding, quick drying stains that offer no obstruction to a fast schedule.

This stain is a striking example of the forward strides made in formulating new finishing materials during the past quarter century. Undoubtedly in time it will, for all practical purposes, replace the water stains and oil stains mentioned.

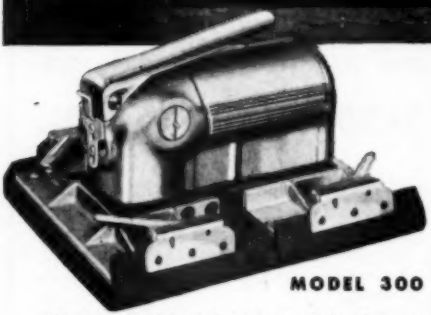
The dye, of course, is of acid aniline colors. One important solvent is ethylene glycol, a member of the alcohol family. Another solvent often used in place of ethylene glycol is diethylene glycol, another important member in the alcohol family.

After the dye has been dissolved by the glycol, it is diluted with methanol, another alcohol but a fast evaporator.

The recommended procedure is to secure these stains from your finishing material supply house ready mixed. At that, don't overstock. Both materials are hydrophilic and will dissolve in water if added. Occasionally a metal container is attacked by the chemical, resulting in a color change. Other dangers are from fire and evaporation if open to the air.



Rubbing the Finishing Coat



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Sap Stains, Shading Stains & Toners

A few years ago furniture manufacturers abhorred the idea of sapwood on walnut veneer almost as vigorously as a finisher dislikes orange peel.

One reason for this was the expensive and almost impossible task of staining the light wood to match the heart with the meager stains then available. As a result, the practice in cutting veneer was an expensive process of removing the sap edges before splicing into a veneer top; the waste as well as price went up. As for texture and grain character, after finishing there is little noticeable difference when stained properly.

A good sap stain should be non-grain-raising as recommended for blending. Most sap stains are formulated to match the heartwood when filled and coated. Consequently the stain for sap walnut bears a noticeable resemblance to blue-black instead of customary walnut brown.

Sap stains, at one time, were carefully and meticulously applied by brush or felt. In fact, a sap stainer enjoyed the distinction of a Michelangelo or a Rembrandt.

The improvement in spray guns and equipment is another factor that has brought a far-reaching change in methods of sap stain application.

Today, a skilled spray hand can, with a small touch-up gun, do a superb job of staining the sap streaks in wood at a high production level. There are no harsh lines as left by felt, for the gun can be adjusted to gently feather the edges to blend perfectly with the heartwood.

Following the sap staining, when a non-grain-raising stain is used, there is no drying delay; the blending stain can be immediately applied. However,

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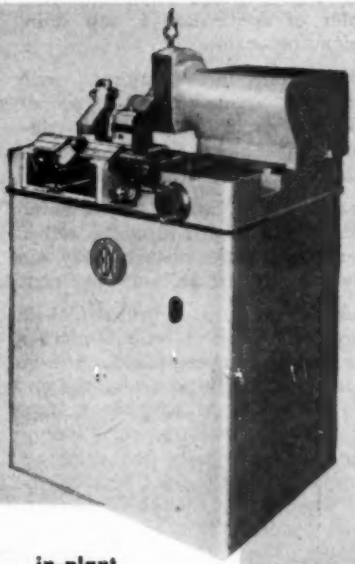

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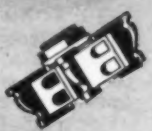


This free REDCO bulletin illustrates and describes in detail the REDCO Profile Grinder. Write for it today.

the order of application is sap stain, then blending stain.

Shading stains are formulated with lacquer sealer stained with the proper dye. You can use your non-grain-raising stains for coloring the sealer to the desired color.

Greatest use for these stains is found in shading to give a highlighted effect. In other words, a method of quickly and cheaply reproducing an antique finish.

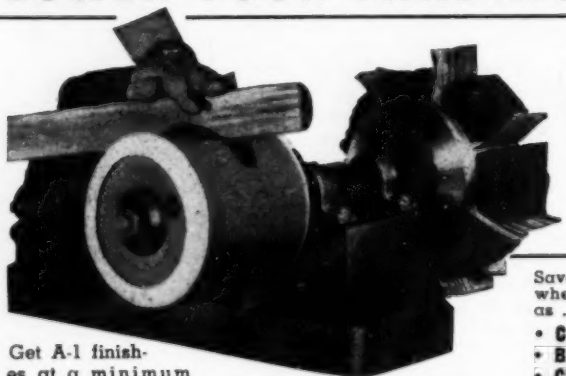
Mahogany furniture finished with the proper shading technique gives a superb finish that commands a high price. In shading drawer fronts the gun is held obliquely to the edges, thus giving a shadow of dark wood around the edges and gradually feathering out to a light mahogany color toward the center. The effect is obtained on ends and tops by forming a dark frame at the edges. The corners are usually darkened the heaviest. Applied over the sealer coat, it requires only a few minutes of drying before the top coat can be applied.

Another stain often used on high quality furniture is known as glazing stain. Others refer to these stains as wiping glaze. They are pigmented stains specifically formulated to dry slowly to permit more time for wiping and blending with a brush. They should be applied over the regular sealer coat and are of a dark color to give a highlighted effect.

They are applied with a good bristle brush or spray gun. The skill comes in removing that portion not needed and feathering out properly to obtain the desired effect.

Glaze coats were devised to tone down the color and to reproduce the effects left by the old masters when finishing was done with shellac, oil and a pad as described by Sheraton.

LOWER YOUR SANDING COSTS!



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Save time and materials when you sand such items as . . .

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T.M. REG.

Here is the *new look* in ceilings. It is achieved with *Sea Swirl* decorative plywood, made from superior grades of Douglas fir plywood. This three dimension plywood is beautiful, practical and versatile.

Interior and exterior types are available in 4′ x 8′ size, 5/16″ thickness (other sizes on special order). Uses are unlimited in remodeling or new construction: for ceilings, walls, built-ins, furniture . . . *Sea Swirl* is available at APMI sales warehouses. Contact the one nearest you or write for illustrated booklet.

APMI

Producers of Sea Swirl, Douglas fir plywood, mahogany faced plywood, Plyron, Handy Panels.

Associated Plywood Mills, Inc.

General Offices: Eugene, Oregon
Mills at Eugene and Willamina, Oregon

SALES WAREHOUSES: 4268 Utah St., St. Louis, Mo.; 4814 Bengal St., Dallas, Texas; 4003 Coyle St., Houston, Texas; 1026 Jay St., Charlotte, N. C.; 111 Welborn St., Greenville, S. C.; 925 Toland St., San Francisco, Calif.; Eugene, Ore. **SALES OFFICES:** 31 State Street, Boston, Mass.; 1854 Brae Burn Road, Altadena, California.

WOODWORKERS SAY:

"Durham's Rock-Hard Water Putty covers up Nature's mistakes as well as our own. It handles beautifully — finishes smooth as velvet."

Durham's Water Putty has great strength and adhesion. This modern plastic fills knotholes or cracks, replaces chips, fills and smooths off edges of plywood, etc. *Absolutely does not shrink.* Comes in 25, 50 and 100-pound drums in powder form—keeps indefinitely. Mix with water as needed. Send now for free sample and prices.

DONALD DURHAM COMPANY
220 School Street, Des Moines 4, Iowa

FREE Sample
Send request on your letterhead for liberal sample free. No obligation.

THE MODERN PLASTIC REPAIR-MATERIAL IN POWDER FORM

The first step is to apply the glaze over the entire surface. The second step is to remove the center portion with a rag, and the third step is to wipe the glaze to a thin coating with a clean bristle brush. Unless care is taken, the pigments will be left too heavy, thus obscuring the grain and color underneath. You will find the heavier shading is left on the edges, gradually thinning out at the center.

A glaze stain can be coated immediately with lacquer without harm. Since the stain does not harden, care must be exercised not to touch the surface till covered with the lacquer or varnish.

Stain Mixing

The modern trend in furniture finishing is away from experimental mixing in the factory to that of utilizing the skill, technical knowledge and laboratory facilities of the finishing material supply house which maintains a staff of technicians for this specific purpose. Even with these facilities available, however, there is a distinct advantage to the manufacturer to carry on a limited exploratory program in stain formulation. It is useful in the production of specialized furniture manufacturing for matching decorative pieces.

For this work, five gallons of each of the following non-grain-raising stains are the easiest stocked, quickest to use for formulation, and repeatedly stable in color retention and reproduction. The five basic colors are orange, yellow, black, scarlet and red.

An example of how all were used in formulating a special matching mahogany stain was adequately demonstrated a few months ago. A furniture manufacturer was called upon to reproduce a chest of drawers in a finish to match a bed. With a few minutes of experimenting, it was found that 16 oz. orange,

An extra salesman

TO HELP YOU SELL MORE WOOD PRODUCTS:

NELSONIZE

THEM AGAINST DISTORTION!

No worry about warp here!
Nelsonized drawer will also resist stain, of anything from water to ink. (Photo courtesy Hazard Editorial Offices. From the Indiana Desk Co. display at a Wood Office Furniture Institute exhibit).

To clinch the big orders here's a real selling feature: DIMENSIONAL STABILITY!

NELSONITE is the best insurance ever developed against warping wood or stuck doors and drawers. Proven success on everything from boats to bureaus. Its unique formula carries deep into wood fibers, seals and locks them against moisture damage.

NELSONITE lends other useful properties to wood. It's an excellent dirt and stain repellent, keeps surface easy to clean or wax. It drastically reduces grain checks.

NELSONITE makes an excellent finish base. Helps bond finish firmly to the wood.

Independent lab reports (sent on request) show NELSONITE has distinctly better control of shrink and swell than any other stabilizer. The final test is yours to make!

NELSONITE®

LAB-TESTED AND PROVEN IN THE FIELD!

Nelsonite Chemical Products, Inc., Grand Rapids 2, Mich.

MAIL COUPON TODAY FOR FREE SAMPLE

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Gentlemen:
We are interested in a Nelsonite formula for the following wood and wood products.....
Please send us sample to meet our individual specifications, and suggested tests for us to make, at no charge.

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Address.....
City..... Zone..... State.....

FAMOWOOD ... *the AMAZING* ...

ALL-PURPOSE PLASTIC for wood finishes!

Applies like putty... Sticks like glue!

FAMOWOOD is the answer...where wood finishes are important. Simple to use... efficient, lasting, time-saving, when filling wood cracks, gouges, nail and screw holes or correcting defects. Dries quickly, does not shrink. ***Stays put*** under adverse conditions. FAMOWOOD sands easily, does not gum up sander. ***Takes spirit dye stains freely.*** Waterproof and weatherproof when properly applied. Ready to use— ***"right out of the can."*** Fifteen matching wood colors ...with amazing matchless wood finishes.

USED BY ... FURNITURE MFGS. • SASH AND DOOR MFGS. CABINET MAKERS • CONTRACTORS • BOAT BUILDERS • PAINTERS AIRCRAFT PLANTS • PATTERN SHOPS • HOME BUILDERS • ALL WOOD PRODUCTS

FAMOWOOD descriptive literature & price list on request. Distributor & Dealer inquiries invited, write Dept. WD-5

BEVERLY MANUFACTURING COMPANY 9118 SOUTH MAIN STREET LOS ANGELES 3, CALIF.

Manufacturers of...FAMOWOOD • FAMOGLAZE • FAMOSOLVENT

13 oz. yellow, 5½ oz. black, 6 oz. scarlet and ½ oz. red gave a highly satisfactory stain.

The necessary equipment and space for carrying on a limited color laboratory is not a great undertaking. Here, for example, are the things needed:

(a) One set of aluminum measuring spoons—1 tablespoon, 1 teaspoon, ½ teaspoon and ¼ teaspoon. Three teaspoons equal 1 tablespoon, 25 quarter teaspoons equal one fluid ounce.

(b) 1 Ounce glass

(c) 2 ounce glass

(d) 4 ounce glass (1 gill or ¼ pint)

(e) 1 pint (16 oz.)

(f) 1 quart (32 oz.) graduated in ounces.

(g) A pair of small scales for measuring powder dyes.

A small section of the finishing room well lit with natural daylight, preferably reflected northern daylight, will serve adequately for carrying on the mixing.

How To Apply Stains

The type of stain product and production layout are important factors to consider when contemplating ways of applying stain. A spray gun is one method. but some jobs are obviously too small to warrant the use of a spray gun. An example of this is staining a quarter inch white wood moulding to walnut, mahogany or cherry on a chest of drawers. The cost of waste stain and additional labor for masking would be discouraging.

For staining large case goods, the large production spray gun is advisable. For spraying spirit, water, non-grain-raising and oil stains, 30 to 40 pounds of air pressure is sufficient. In general, the larger the gun the higher percentage of material waste through overspray. And since the non-grain-

"You can *always* count on quality work!"

With Jones & Orth cutter heads on the job everybody concerned is happy with the results — including the customers of the plant!

Jones & Orth users find that it is no trick at all to turn out a large daily output of consistently high quality, true-to-pattern work — with a minimum of maintenance and servicing expense.

Jones & Orth H-type cutter heads, such as the model illustrated, are unsurpassed for simplicity of design, perfect take-up for wear without change of pattern, and over-all economy. May we tell you more?

Write today for new catalog, and name of our dealer nearest you. Address either our Seattle or Memphis branch!

Need specially designed cutter heads? Let our engineers help! Write us in detail. Prompt service!

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BUILD A BETTER FINISHING DEPT.

Switch to DETROIT "TAC" RAGS and avoid rejects. Remove all dust, lint and sand quickly, efficiently. The standard for 17 years. Order from your supplier today, or send for sample.

FLAME RESISTANT

DETROIT HANDY "TAC" RAG

DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.

RESTORE PAINT IN 2 MINUTES

PER GALLON WITH
MIRACLE BLUE - BOY
5 GALLON
PAINT REJUVENATOR

Paints, lacquers and enamel products can be restored to their original consistency without opening the can. Units available to handle from ¼ pint to 50 gallon drums. Immediate delivery.

Originators of paint rejuvenating equipment---sixteen years—thousands of satisfied users.

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raising stains are somewhat expensive, precaution should be taken not to use a larger gun than necessary to do the job satisfactorily.

Choose the proper gun for the job. For instance, the larger gun with an E fluid tip or needle and Number 30 air cap consumes over 8 cubic feet of air per minute at 40 pounds pressure; the smaller type gun at the same pressure with an F tip or needle and Number 90 air cap uses only 3.99 cubic feet of air per minute. This means the larger gun consumes approximately twice as much material.

How both guns can be used to an advantage was well illustrated to the writer a few months ago by a manufacturer of small case goods. The articles being stained were constructed of mahogany except the stretchers, legs and mouldings which were of white gum.

The two guns were fastened together and the operator triggered the small gun to stain the narrow white wood mouldings and the larger gun to stain the broad mahogany panels. If he had used the large gun for both jobs, his consumption of stain would have been twice as much.

The same combination was being used in another plant for applying walnut sap stain and walnut blending stain on cedar chests.

What type of container are you spraying from? A pressure feed tank or a gravity feed bucket? This can mean the difference between a good and poor stain job.

One concern was disappointed over the results obtained when they switched from pigment wiping stains to the non-grain-raising type. Gum chests sprayed with mahogany stain looked like a severe case of measles. They were about ready to throw the whole contraption up the spray booth when it was sug-

gested they try a pressure feed tank instead of their gravity feed bucket. The gravity feed method went out with the buggy, and for even coating in spraying either stain, lacquer, or varnish, a pressure feed tank is unreservedly recommended.

For satisfactory results with stain, a tank pressure of five to ten pounds is best. This, to some extent, depends upon how long a fluid hose is used to reach the gun; the longer the hose the more pressure required.

Medium soft white wool felt is excellent for applying stain on small areas, especially where masking hard-to-get places is not practical. In applying stain with a felt, long full strokes should be made with as few lapping strokes as possible. For wide sections, try a felt wide enough to reach across the board so the job can be completed in one stroke.

Stain can be applied by dipping, but guard against puddling. Spirit and non-grain-raising stains can be applied by dipping with a high degree of satisfaction. Indeed there is a noticeable saving in both labor and materials where dipping is practical.

One manufacturer of novelty tables is dipping white legs in non-grain-raising stain before assembling. The results are quite satisfactory—fast and without delaying the finishing line. Generally slow masking of walnut and mahogany would be necessary here.

Oil stains can be applied satisfactorily with a brush without the danger of overstaining. Water stains, however, if allowed to puddle or overlap will leave dark spots on those areas where the stain has collected.

The End

Golf Pro: "Now just go through the motions without driving the ball."

Beginner: "That's precisely the trouble I'm trying to overcome."

BETTER PERFORMANCE at lower cost!

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HOT SPRAY WOOD LACQUER NO. 21

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Use the hot-spray process for a fast-drying, highly serviceable finish that cuts finishing costs! Your product benefits from all the well-known qualities of lacquer plus the remarkable advantages of the hot-spray technique:

Fast, economical application . . . No extra solvents . . . Solids are higher . . . Fewer coats needed . . . Smooth, glossy or satin finish . . . Better flow-out covers imperfections . . . Protects against sag, blush or orange peel.

For further information on how Randolph's Hot-Spray Lacquers can reduce your finishing costs, write,

RANDOLPH PRODUCTS CO.
DEPT. W, CARLSTADT, N. J.

GRINDER DESCRIBED

A new piece of literature prepared to feature the Rogers massive high production series 220 grinder is now available. The machine is manufactured by Samuel C. Rogers & Co., Buffalo 11, N. Y.

Bulletin 220 fully describes the operation of the heavy duty knife grinder. It also is fully illustrated with cuts showing the grinder, adaptations and features.

STOP DUST

DUSTKOPS — **20 Models**
UNIT TYPE — 300 to 3600 cfm
LOW COST — ¼ hp to 5 hp

AVAILABLE FROM STOCK

For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

Send for Cat. 605a; describe problem.

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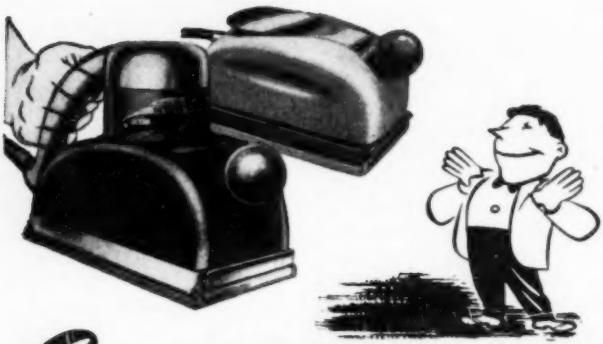

Easy The ONLY RECIPROCATING SANDER Powered with an ELECTRIC MOTOR

Now TWO full-size—positive drive—genuine reciprocating, ⟨⟨STRATE-LINE⟩⟩ action sanders—Electric and Pneumatic (air) Powered DETROIT EASY FINISHERS

STRATE-LINE reciprocating action works up to right angles —no abrasive scratches, no hand clean-up—*does the complete job!*

POSITIVE DRIVE—plus rugged, powerful air and electric motors—insures power for the really tough jobs. *Try to stop an Easy!*

WET SANDING with Model AF's *new* No-Surge mist type automatically controlled water applicator for wet work maximum efficiency *and operator comfort.*

FULL SIZE—single pad, proven most convenient—uses ⅓ standard abrasive sheet, 3⅔" x 9". Convince yourself—try an Easy! Write for bulletins describing Model DF (electric) and Model AF (air).

DSM DETROIT SURFACING MACHINE COMPANY
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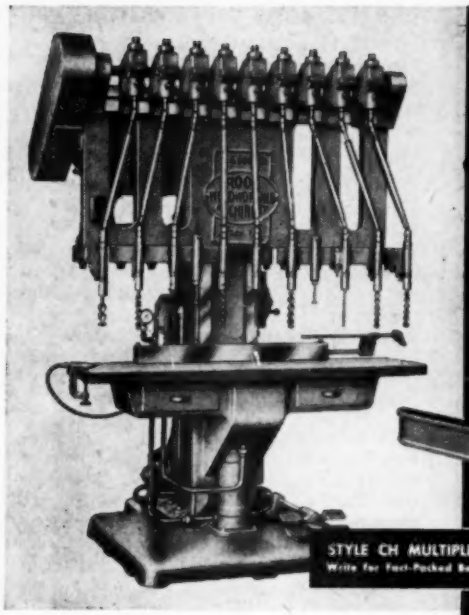
FACE SHIELD

A face shield with sufficient clearance to be worn over glasses with ultra-modernistic frames and industrial goggles has been designed and manufactured by the Boyer-Campbell Co., Safety Division, 6540 St. Antoine St., Detroit 2, Mich., and will be identified as Model No. 301. The shield is glove-buttoned to a form fitting head gear which is readily adjusted to any shape or head size. Three types of shields are interchangeable on one head gear.

NYLON-LINED BEARINGS

The operating principles, design, advantages and application of nylon-lined, "Nylined," bearings for rotation and reciprocation are set forth in a 4-page bulletin issued by Thomson Industries, Inc., Manhasset, New York.

If we didn't have mirrors, there wouldn't be nearly so many cases of love at first sight.—**Catholic Digest.**



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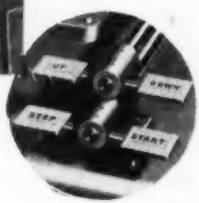
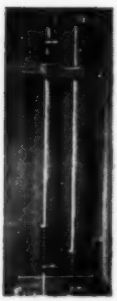
BETTER BORING!

HYDRAULIC FEED FOR MORE PRODUCTION, BETTER CONTROL, MORE ACCURACY

Selective type feed controller provides infinite number of feed strokes, assures greatest production.



Dual foot control stations for starting, stopping, or reversing table at any point of feed or return stroke.



Simple setting provides automatic continuous or intermittent feed strokes. Also, micro setting of feed stroke. Bores to thousandths accuracy!

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- Sealed grease bath gear box
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- Swing-nose spindle—increased set-ups
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- Exclusive Root long-life universal joint

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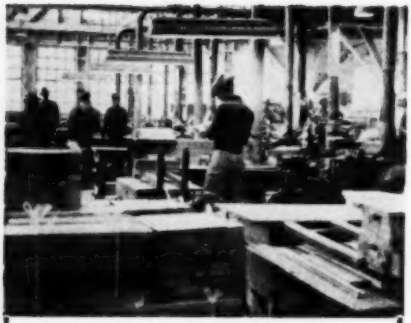

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Solid and Glued
Cut to Size
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Building Trade Products

Mixed cars comprising hardwood flooring in Straight-line standard strip and Unit Wood Blocks in oak, beech, pecan; Random Width Oak Plank — each finished or unfinished. Oak stair treads, risers, thresholds. Arkansas Soft Pine trim, mouldings, finish, yard stock.

BRADLEY LUMBER COMPANY *of Arkansas*
WARREN, ARKANSAS

CARTER ADDS DISTRIBUTORS

H. H. Hobelmann & Company of San Francisco, Calif., and John T. Everett & Company of Memphis, Tenn., have been appointed regional sales representatives for Carter Products Company, Inc., of Grand Rapids.

The Hobelmann firm will be regional distributor for Carter products for all the Pacific and western states, while the Everett company will be distributor for the entire south and southeastern states. A. G. Carter, president and treasurer of the Grand Rapids concern, says that other regional distributors will be appointed at a future date for other territories, under a program of sales organization expansion.

Carter Products Company, Inc., manufactures a line of nationally advertised woodworking tools and aids, including the Carter rigid wheels and "quick change" tires, Carter guides for band saws, the guide line light for use on ripsaws, plywood set-up tables and other equipment.

AETNA EXPANSION

The opening of an expanded operation in Grand Rapids, Michigan, has been announced by Aetna Plywood & Veneer Company of Chicago.

The new Grand Rapids warehouse provides 26,250 square feet of floor area, double the size of the former building. With space for 45 carloads of plywood and veneer, the warehouse has been organized to combine speed and efficiency. The additional space will enable the Grand Rapids branch to carry a larger inventory and a more diversified line of stock.

Conveniently located at 825 Buchanan Avenue, S.W., the warehouse has facilities for inside loading and unloading of trucks, and is able to accommodate three freight cars and five trucks simultaneously. Modern plywood handling equipment includes fork lifts, platform transporters, and pallet-type transporters. Aetna trucks deliver orders up to a radius of one hundred miles. Mr. Clarence Kohnke is the manager of the new warehouse.

Stop!

Don't send a Boy

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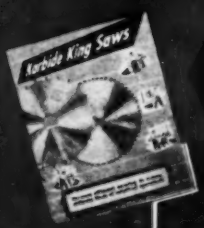
DO YOUR CUTTING FASTER, CLEANER, MORE ECONOMICALLY

DON'T try to use old fashioned or inadequate saw blades for today's modern high speed cutting operations. Use KARBIDE KING SAWS that give you fast, smooth cutting that requires no further finishing before gluing operations. Tough steel blades with the finest tungsten carbide tips ground to precision tolerances make KARBIDE KING the best woodworking saw value you can buy. Types to meet all requirements are available from the complete line. Check into KARBIDE KING sawing and find out how to double your wood cutting efficiency!



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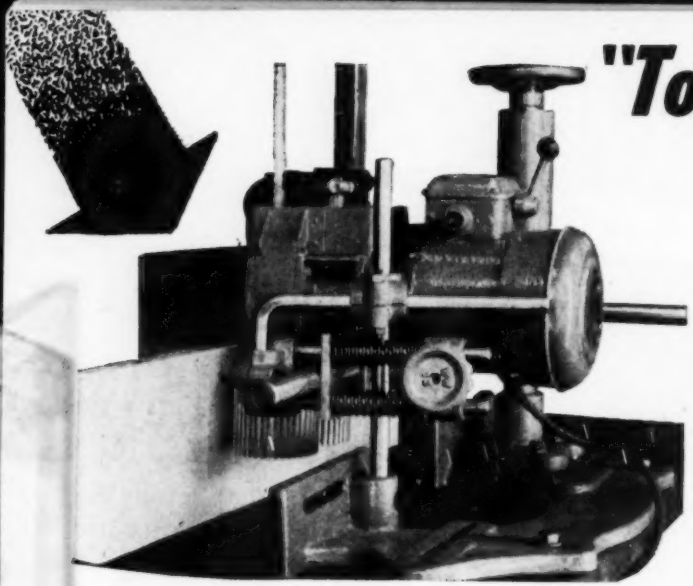

"Tool Up W

Headqua

WOODWORKERS' POWER FEED ATTACHMENT

For Band Saws, Variety Saws, Shapers and for use as facing attachment on Jointers. Cut shows attachment fitted to 42" band scroll saw. Can be used on 34" to 42" band saws. Feed attachment is motor driven with ½ H.P. 220 Volt, 3 Phase 60 Cycle motor. Has variable feed 10 to 90 feet per minute. Swaged tooth band saw blades are recommended for best results. The attachment produces accurate resawing. Stationary gauge is fastened to left of saw blade to desired position. Spring pressure on feed rollers allows for uneven thickness of lumber.

This attachment fitted to your band saw will handle resawing of any stock that the band saw itself will handle. By tilting table you can saw bevel siding. Machines with 5 H.P. motors will handle up to 8" boards. For lumber up to 12" wide a 7½ H.P. motor is recommended.

PRICES: Woodworkers Power Feed Resawing attachment, motor driven with ½ H.P. motor, 220 Volt, 60 Cycle, 3 Phase, for use on band saws for resawing, saw tables, shapers and jointers. F.O.B. Chicago $575.00
Band saw blades 1¼" to 1¾" in width with swaged teeth, Per lineal foot....$1.15

Can furnish new and rebuilt 36" band sawing machines. Also rebuilt 42" band saws.

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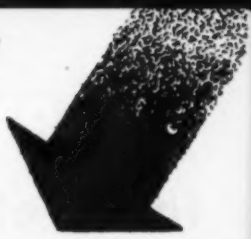

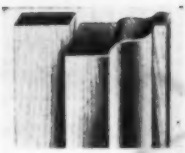

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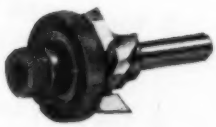
Fast, clean, accurate production, with solid steel cutters revolving at 3600 R.P.M.—For divided light and fancy sash 1⅛", 1⅜" & 1¾" sizes.—One-half H.P. single or 3 phase motor. —Foot treadle available for divided lights on heavy doors.



Formica Trim Tools
for trimming Formica from tops and edges of tables, counters, etc.

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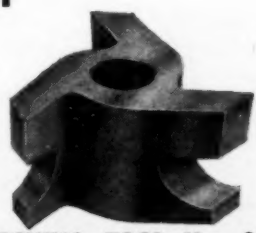
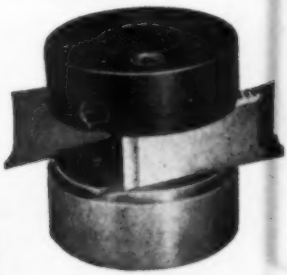
Cupboard Door Cutters High Speed & Carbide

Made of High Speed Steel and Carbide tipped, also Vigorite Processed for long wear. ½" to 1¼" holes with three teeth.





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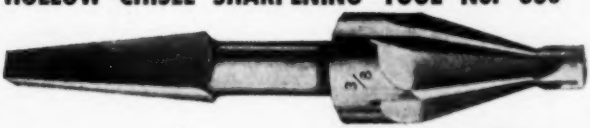
Safety Shaper Collars

HOLLOW CHISEL SHARPENING TOOL No. 830



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FRICK EQUIPMENT

New literature from the Frick Co., Waynesboro, Pa., describes their swing cut-off saw. Their bulletin No. 73-D shows a variety of Frick machinery applicable to the woodworking industry. Each machine is illustrated and described. Here are some of the machines included: swing cut-off saw, log turner, planer-matcher-moulder, No. 1 sawmill, trimmer, gang edger.

Special emphasis is placed upon their sawmills and illustrations show details found in these mills. Specifications are given and the machines are fully described.

Particular mention is made of their horizontal wedge saw machine. Said to be something new for the rapid sawing of wedges for shoring timber in mines, trenches, excavations or wherever wedges are used, it will handle blocks 4" to 7" thick, 12" to 18" long, and any width that can be made from logs or slabs.

WOOD FINISHES

An illustrated booklet giving step-by-step instructions for creating fine wood finishes is available from Monsanto Chemical Company's Western Division, Seattle, Wash.

The detailed, easy-to-read instructions, based on the experience of outstanding wood craftsmen, include "recipes" for bringing out the characteristic beauty of a variety of woods and achieving a range of color effects. The booklet features Rez sealers and finishes.

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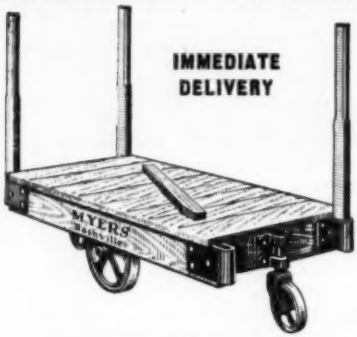

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SUBCONTRACTING PUBLICATION

Keller Products, Inc., Manchester, N. H., has worked up a fine piece of literature showing their facilities for subcontract work. The booklet carries seven classifications of their products in a concise and well-developed outline form. It also includes a list of firms using Keller products. In a second classification setup they outline their specific facilities and equipment. The booklet finishes with a number of illustrations, showing their products and utilizations.

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BUSS PLANER

Bulletin No. 61, published by the Buss Machine Works, Holland, Michigan, describes their planer No. 4-L, models H and M. This is a four roll, single surfacer. On production work this machine will plane 4/4, 6/4, 8/4 lumber in random lengths and up to 2,000 board feet per hour, we are told.

Several pages of illustrations—photos and diagramatic sketches—show the planer and its parts. The 10-page booklet gives a complete description of the machine and lists specifications. Safety features are also described.

MILLIKEN NAILER

A new bulletin on Milliken nailing machines has been issued by Hastings Sales Engineering Co., 795 Boylston St., Boston 16, Mass. The brochure describes 15 new features for the Model C nailer.

These machines can be equipped to handle nails, pins or rivets, ranging in size from 3/16" to 3/4" long and special models may be tailor-made. There are numerous possible applications, the bulletin states. Complete specifications and illustrations are found in this new piece of literature.

GLUING EQUIPMENT

The Union Tool Corporation, Warsaw, Indiana, will mail on request a new illustrated folder presenting its complete line of standard wood gluing equipment. The company designs and manufactures all types of standard ahd special equipment to meet any wood gluing requirement.

SEA SWIRL BOOKLET

Of special interest is a 16-page booklet issued by Associated Plywood Mills, Inc., Eugene, Oregon, describing the company's new decorative plywood, Sea Swirl.

Said to be light, durable, splinterproof, and easy to apply, "Sea Swirl" is prepared by a special manufacturing process which removes the soft growth from highest quality Douglas Fir. The resulting surface gives a distinctive three-dimensional effect, with natural grain patterns of the wood forming pleasing swirls and contours. Sold in standard 4' x 8' panels, 5/16" thick, for both interior and exterior use, it is also available in other sizes on special order.

The booklet describes various applications for walls, furniture, ceilings, and built-ins, with accompanying full color drawings. Various color effects also are shown. The wood may be used in natural tones, metallic finishes, or in a wide variety of pastel colors.

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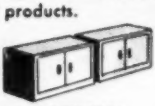

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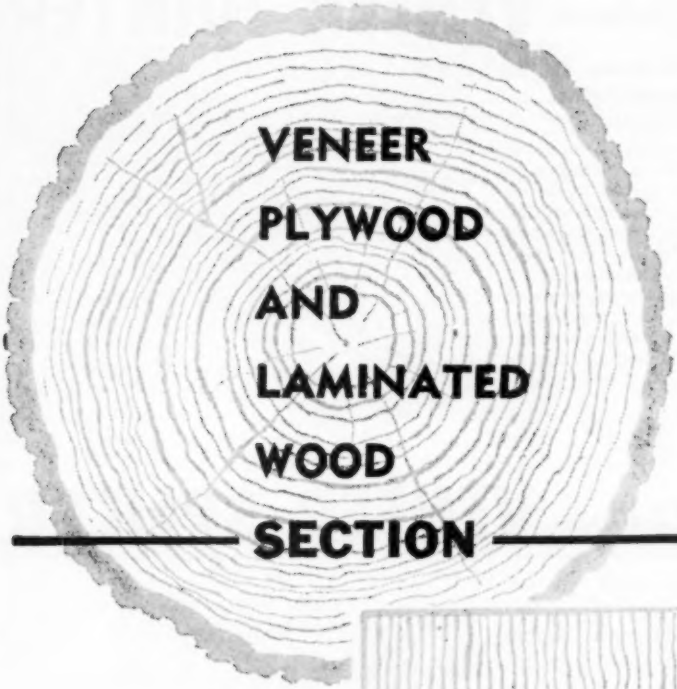

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Features . . . .

Types of Plywood
By Thomas Perry

Veneer & Plywood
By Ned Bailey

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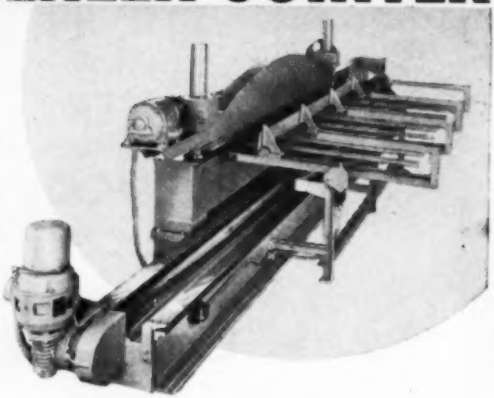

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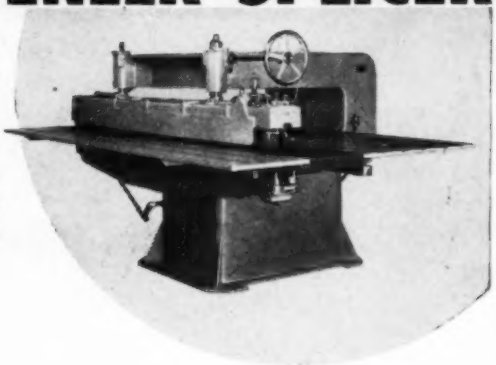

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TYPES OF PLYWOOD

Part 8

PLASTIC FACED PLYWOOD

By Thomas D. Perry

PLYWOOD is a highly versatile material with many desirable qualities, and it is seldom that any application utilizes all of these qualities. In the case of 5-ply lumber core constructions in household furniture, for tops, ends, doors, shelves and drawer fronts, usually 5/8" to 7/8" thick, the plywood serves chiefly as a foundation or base for thin and fragile face veneers. Such a base has dimensional stability, i.e., the tendencies to shrink, swell and warp are reduced to a negligible minimum. It has reasonably equivalent strength and stiffness in all directions and it is available for large areas.

The veneer faces and the finish coatings will withstand any normal service to which such furniture is likely to be subjected. There is a point, however, beyond this normal service, at which such wood surfaces may be seriously damaged. This point will be determined by the hardness, or wear resistance, of the wood, which can be evaluated by its density. The density of the face veneers in normal furniture plywood will vary from a specific gravity of 0.46 for African mahogany, through other intermediate species, to 0.68 for white oak.

Then again, the finish coatings on normal furniture are not sufficiently resistant to the heavy duty that occurs in kitchens, pantries, restaurants, cafes and other similar locations. The handling and moving of hot and cold food containers of metal, glass or porcelain, are too severe for normally finished veneered surfaces to withstand. The frequent cleansing of such surfaces with hot water, soap and detergents would soon ruin any wood veneer surface whether finished with natural, stained or opaque coatings.

The answer to these problems has been found in the use of sheeted plastics, usually of a density represented by a specific gravity of 1.0 to 1.25. This plastic surface layer from 1/32" to 1/16" thick, takes the place of the usual veneer face and is mounted on the plywood base, thus providing a wear resistant surface that will be adequate for kitchen equipment. These plastics have a natural lustre, which is not affected by continuous and vigorous washings, nor will they be injured by abrasions or by indentations caused when moving kitchen utensils. Properly selected plastics have excellent resistance to such heat and cold as may occur in cooking or in handling frozen foods. Another advantage is that plastics are available in light pastel colors, plain or with backgrounds of textiles or other decorative effects.

Plywood Required

The plywood foundation for such plastic faces must be made with an adhesive of sufficient water resistance for the intended service. If installation is anticipated near sinks or washing machines, only Type II (high moisture

resistance) in hardwood plywood (CS-35-47) or "exterior" type in Douglas fir plywood (CS-45-48), should be used. These are both all-veneer constructions, without lumber core. In hardwood plywood, Type III (low moisture resistance) might be marginal, but not with lumber core.

Table tops, cabinet sides, ends, doors and shelves, where there is little, if any exposure to moisture, may permit plywood foundations made with any standard plywood glues or adhesives. It is always good insurance for customer satisfaction to err on the side of higher moisture resistance than appears needed, and the slight additional cost is usually justified.

Fig. 1. Cross section of metal edgings for plastic faced plywood.

Both hardwood and softwood are used for such plywood foundations, usually in 5-ply constructions, but minor surface defects and sound repairs are allowable, since they are thoroughly masked by the plastic face. There are definite savings in cost by using such intermediate grades of plywood as contrasted with the grades that would be required for the application of the usual finishing processes. The use of 3-ply foundations is not advised, since warping possibilities may be troublesome. Still further, the required thickness of 5/8" is not available in 3-ply all-veneer constructions.

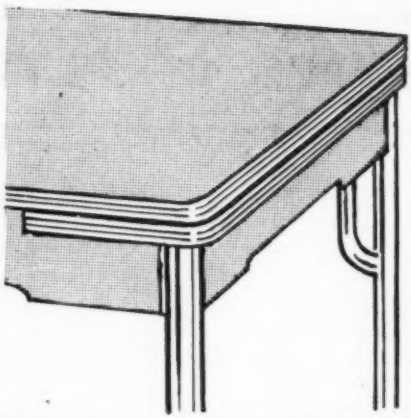

Fig. 2. Corner of plastic faced plywood table top. Extension leaf can be pulled out to be even with top of table.

Attaching Plastic Faces

Balance is as necessary in attaching plastic faces as it is in making the plywood itself. The layers on either side of the center should be symmetrical. The back plastic layer, on the opposite side to the plastic face, should be reasonably equivalent to the face in strength, and unless exposed to view, as on the inside of a door, can be plain rather than decorative. There may be instances in custom-built work, where the plastic faced plywood is firmly anchored, in which a plastic face on one side only may be satisfactory.

Attempts to glue the veneers into plywood and to attach the plastic face, in the same gluing and pressing operation, have not been satisfactory. This procedure tends to imprison too much moisture, (i.e., glue solvent) in the plywood. The moisture normally evaporates from the wood surface, but can-

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not readily escape through the relatively impervious plastic face and back.

Special attention should be given to preparing the plywood surface before attempting to glue on the plastic faces. Most plywood, made in bundles with room temperature glues, or singly in multi-opening presses, is a trifle thinner at the edges than in the center of the sheet. Not much thinner, but it is enough to present a problem in subsequent gluing. In addition, plywood made in hot presses is likely to have an "ironed" surface, which may retard glue penetration. Hence it is always desirable to plane or scrape a plywood surface to which plastics are to be glued. The cutting knives should be sharp and several light cuts are preferable to a single heavy cut. Planers invariably do more accurate work with thin cuts than when loaded with a heavy cut, or equipped with dull knives.

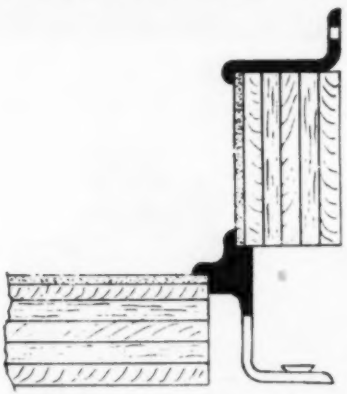


Fig. 3. Metal moldings for built-in kitchen cabinets.

Preparation by sanding is seldom satisfactory, since the abrasive grits tend not only to cut more deeply over the soft spots in the plywood than they do at the harder areas, but also to round any exposed edges. If neither planing or scraping are practical, it is

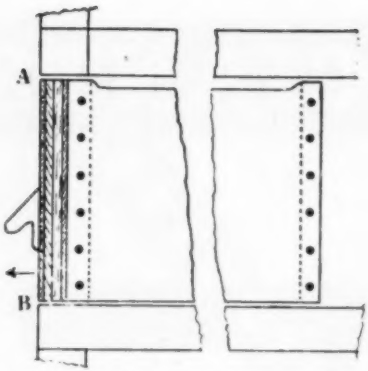


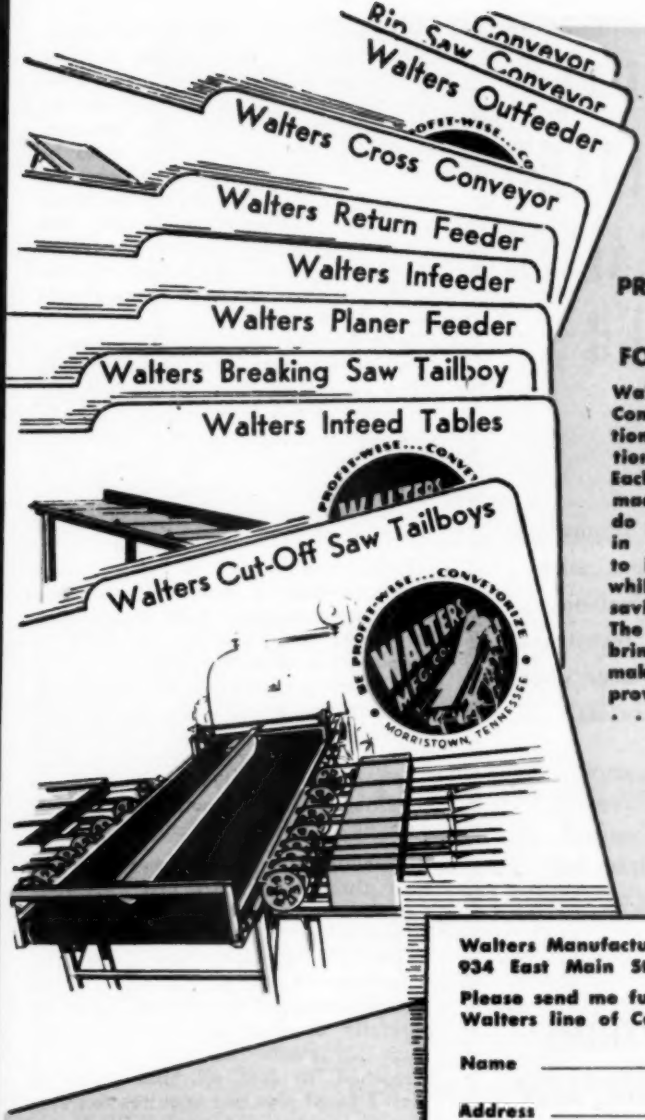
Fig. 4. Cross section of drawer construction.

better to sand than to attempt to glue an unprocessed plywood surface, but the sanding should be done lightly, and with several cuts if necessary. The sander dust should be carefully brushed off or cleaned off with a vacuum.

The plastic surface also should be properly prepared for gluing, removing the glossy surface by a very light sanding. Some plastic sheets are made with a dull gluable surface, but preparation of the surface should not be overlooked.

Hot presses are not suitable for attaching plastic faces, since the smooth surface of the plastic sheet may be marred, and some plastics are softened by the temperatures (250° to 300° F) required to cure resin adhesives.

Either a room temperature urea resin adhesive or a casein glue have been found most satisfactory for joints between plastic and wood. There are inherent difficulties in gluing a relatively impenetrable surface, such as a plastic, to a porous surface, such as a low density wood. Any liquid glue tends to penetrate more readily into the porous wood than it does into the dense plastic surface. Hence glue spreads should be more generous than in wood to wood joints.



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Another "knack" that will be helpful in such gluing is to allow two or three minutes for solvent evaporation—a brief open assembly—before laying up the pile. This open assembly time, however, must be short. A good test is to be sure that the glue line, which was spread first, is still tacky to the touch just before pressure is applied. The squeeze-out under pressure should be a bead about ⅛" diameter, but not enough to run down. Spreading should be on the plywood, using a grooved rubber roll spreader, which is capable of more accurate adjustment than is the metal roller type. There is rather a critical border line between too little and too much glue spread, since too much leaves excess glue solvent that is difficult to evaporate through the dense plastic layers, and too little may result in a weak joint.

It is good practice to allow plastic faced plywood a couple of days on sticks, after removal from the bundle, to permit any interior moisture to evaporate or to diffuse into the wood. The larger the area, the more important this redrying process. The pile should be weighted down with "I" beams to hold it flat during this redrying. Unless plastic faced plywood is properly conditioned at this point, subsequent warping is likely to occur.

Trimming this plastic faced plywood, after gluing, requires a saw somewhat different from that used for normal plywood. The best plastic saws are intermediate—between a saw blade suitable for wood and one customarily used for soft metals. The sawdust should be carefully brushed off after trimming, since all plastic surfaces are easily scratched. In fact, all bulk piling of plastic faced plywood requires extreme care to avoid damage in handling.

Edgings

The raw edges of plastic faced plywood are difficult to finish in an at-

Parts forming back frame of popular piano ready for assembly. Frame consists of 20 separate pieces.

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tractive and durable manner, since they are always subject to considerable punishment. The use of metal edgings has become established and provides adequate durability, with an excellent assortment of pleasing designs, several of which are shown in Fig. 1. Such edgings are extruded metal strips, or may be preformed between rollers, and are often chromium plated. The snap-in type, shown in the lower sketch, is somewhat more expensive and requires an accurately cut groove, but it results in a smoother and straighter edge, than when drawn up with screws spaced some distance apart. Such metal edgings can be bent around outside curved corners, as shown in Fig. 2, or made to conform with inside corners as might occur in plastic faced counters when mounted against a wall. Types of similar metal moldings for attaching such plastic faced plywood in built-in cabinets, against a wall, are shown in Fig. 3.

Cabinet Construction

While plastic faced plywood finds its widest use in kitchen table tops and wall shelves, it is also adaptable for the construction of cabinet doors and drawers. There are some factors that need to be watched in such constructions, since the plastic faces must be protected from the effects of carelessly slamming doors or shutting drawers.

The most difficult strain on any glue joint is the lifting leverage, since it is a characteristic of glue joints to be strong in shear, but relatively weak in direct tension. An example is the drawer construction shown in Fig. 4, in which proper clearances are provided at A and B, so that rubbing against the edge of the plastic is prevented. Under normal conditions, the framework of such cabinets would be built of solid wood, painted or enameled in matching or contrasting colors.

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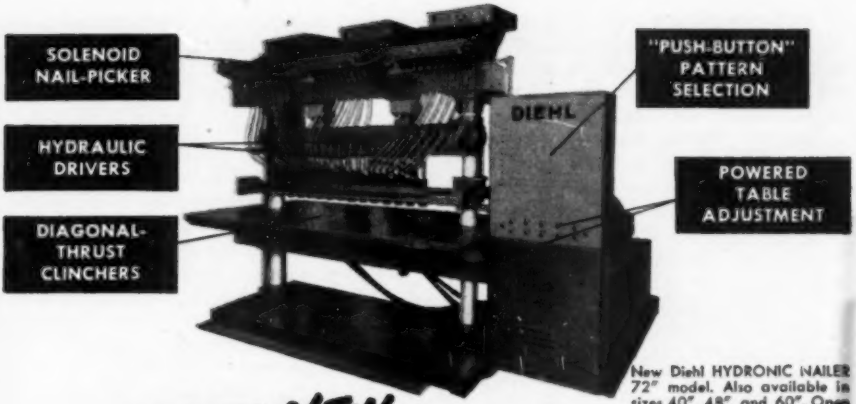

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of this article on plastic faced plywood, there is another interesting construction that has been developed for tops in kitchen cabinets and dinette suites. This consists in making the melamine plastic face directly on a dense Masonite board, about ⅛" thick. This requires the use of some 7 layers of plastic sheets, which have been impregnated, and are assembled and heat bonded on the Masonite board under some 1500 lbs. p.s.i. pressure at 300°F. This plastic faced board is then glued to both sides of a low density fibre core, some ⅝" thick, which has the necessary screw holding power together with sufficient rigidity and dimensional stability for a satisfactory table top.

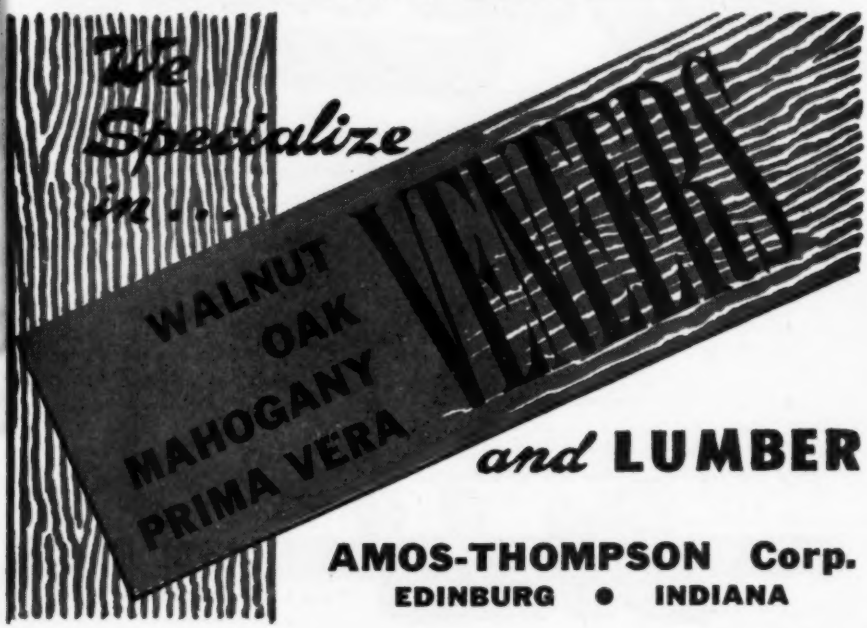
With the present developments in making re-aggregated core material for plywood, from wood waste and a synthetic resin binder, this construction may become competitive with all-veneer or lumber core types of plywood as a foundation for plastic faced kitchen equipment.

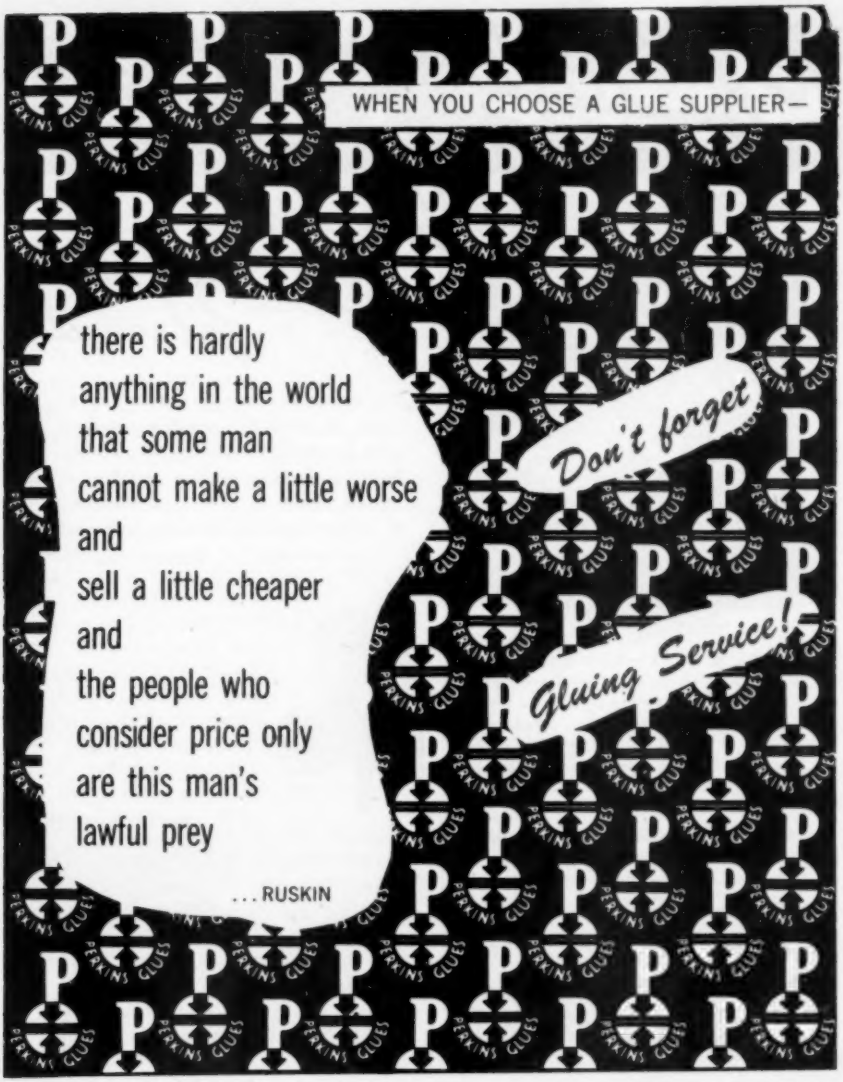
Conclusions

Plastic faced plywood, with its hard durable surface, offers an ideal material for kitchen cabinets and tables. This construction provides the distributed strength and dimensional stability of plywood, efficiently combined with the wear resistant surface of the plastic face. It is another of the many examples typical of the growing program of intelligent plywood utilization.

The End

Man, as an individual, becomes less and less important, not only in the eyes of his ruler, but in his own—and that is the most lamentable aspect of the socialist tragedy.—**Richmond Times-Dispatch.**





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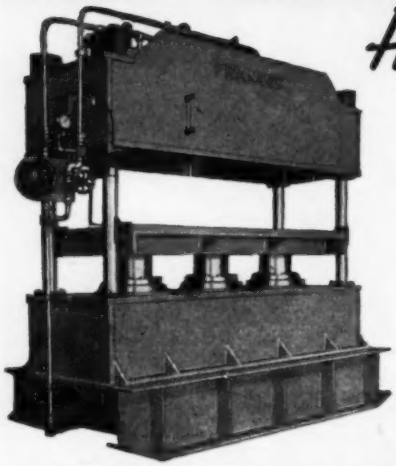

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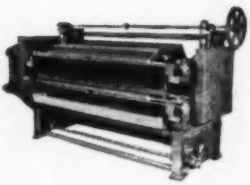

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LAMINATES with Honeycomb Cores

BY JOHN STARR

AN unusual method of using honeycomb core materials now enables Northrop Aircraft, Inc., at Hawthorne, Calif., to save many valuable hours of time in producing semi-monocoque structures of superior quality for military airplanes.

It consists briefly of shaping the core materials for lamination with various facings—such as sheet metal stampings and wood veneers. This eliminates the need for many small parts (such as rivets, stringers, and stiffeners) in the manufacture of components such as airfoils.

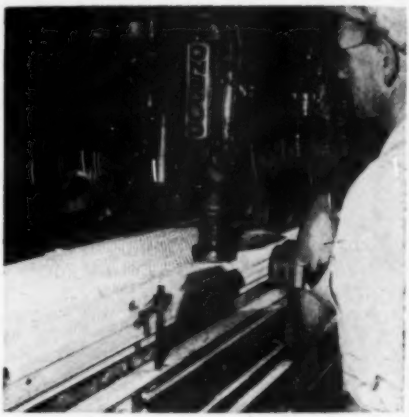
The core materials are porous structures resembling foamed plastics, but can be visually distinguished from the latter to the extent that the cells are symmetrically aligned—much the same as cells in bees' honeycombs. They are currently being produced as standardized "logs" for lamination purposes by U.S. Plywood Corporation of New York City and Western Products, Inc., of Newark, Ohio.

A good example of how these logs are fabricated and laminated at Northrop involves the construction of control surfaces in the following sequence of operations:

(1) A honeycomb log is framed with four knot-free pine planks so that it will have the stability required for machining operations. The plank frame does not cover the honeycomb cells.

(2) An oversize control-surface core is cut from each honeycomb plank in chordwise taper with an Oliver bandsaw.

(3) Without being removed from its wood frame, the rough-cut is clamped in an Onsrud mill and machined in sparwise and chordwise taper to finish dimensions.



A honeycomb core is machined for use in laminating one of Northrop's semi-monocoque control surfaces.

(4) The double taper of the core is inspected by means of a check fixture, then the core is cleaned with hot trichloroethylene.

(5) Facing laminae for control surfaces are cleaned if necessary, inspected, and spray-coated with Plycozite 117C (a high-strength plastic adhesive made by U. S. Plywood Corp.).

(6) The adhesive-coated laminae are air-dried for 1½ hours, then precured in a circulating-oven atmosphere for 2 hours so that all volatile adhesive components will be dispersed.

(7) The honeycomb core is roll coated with two layers of Plycozite 117C to assure an adhesive build-up on each

Adhesive-coated laminates for a Northrop control surface are assembled in fixtures as shown here and then bonded.

end of the honeycomb column structure of at least 0.032", then each coating is air-dried and precured the same as the coatings on facing materials.

(8) Core and facing materials are assembled with bolts and dowels in a positioning fixture on a flat table surface.

(9) The assembly is insulated with six layers of Fiberglas fabric, then two heating blankets are positioned—one above and one below the insulated assembly.

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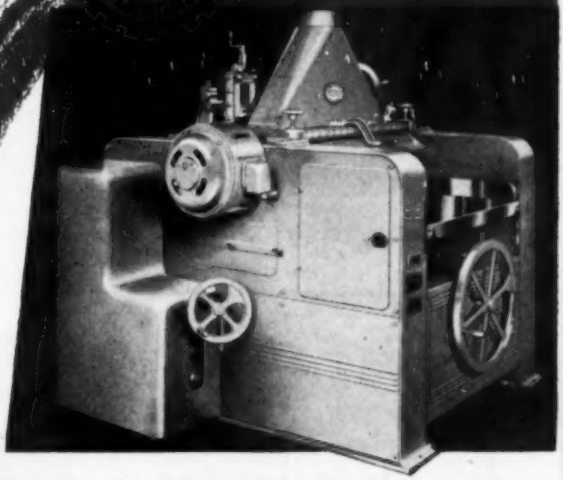

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(10) The pad-covered assembly is placed in a poly-vinyl alcohol vacuum bag, where 12 p.s.i. vacuum pressure is applied and a temperature of 325°F. is electrically maintained for 25 minutes in order to bond the control-surface components by completely curing the adhesive coatings thereon.

(11) The vacuum bag, heating pads, and Fiberglas insulators are removed from the laminated control surface.

(12) End ribs, nose caps, and a trailing edge are assembled with the control surface in a more or less conventional jig.

Minor variations with regard to machining and tooling techniques can be used to adapt this process to the production of virtually any high-strength laminate which should have considerable thickness, lightweight, low cost, heat insulating qualities, extreme vibration resistance, etc.

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Motor-Driven
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A time saving quality tool priced so every worker can have one.

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BLAIR-VERMONT PLYWOOD CO.

Keith C. Aldrich recently resigned as vice president and general manager of the Blair-Vermont Plywood Co., North Troy, Vt. His successor has not been named. E. B. Read, sales manager, will handle all matters of sales and customer relations.

The company, we are told, is operating at near capacity. The North Troy plant is concentrating on the manufacture of door panels and the Hancock plant in supplying cut-to-size panels.

MARQUETTE VENEER CO.

The Marquette Veneer Company expects to start production of veneer and plywood at its new plant in Marquette, Mich., by July. The plant will employ about 100 persons. It covers 36,000 square feet and will produce stock-sized panel and "doorskins." Primarily it will cut doorstock faces for its parent firm, the Haskelite Manufacturing Corp., Grand Rapids, Mich.

AMIDON LUMBER CO. SOLD

The Amidon Lumber Co., Brockway, Pa., composed of Otto M. Amidon and L. L. Amidon have sold their complete stock to the Mid-Penn Lumber Co., Curwensville, Pa. Otto M. Amidon plans to retire.

The Mid-Penn Lumber Company consists of J. Harold McFarland, president; Dean Haley, vice president; John Wright, Hama Tate and W. H. Tate. The new company will wholesale Pennsylvania hardwoods, besides making furniture dimension.

HEAD LUMBERMEN'S CLUB

New officers elected at the annual meeting in Macon, Ga., of the Southeastern Lumbermen's Club include: J. W. (Bill) Zuber, Zuber Lumber Co., president; W. A. Dolan, Jr., Dolan Lumber Co., vice president; and Mrs. Ethalnind McCarthy, Southern Lumber Journal, secretary-treasurer.

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HAS MAINTAINED THE PACE

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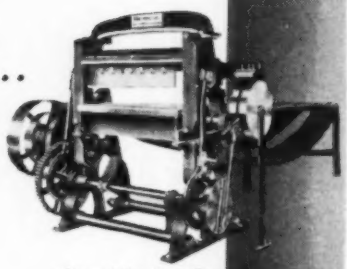

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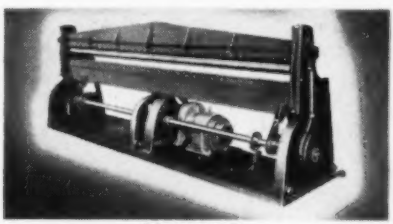
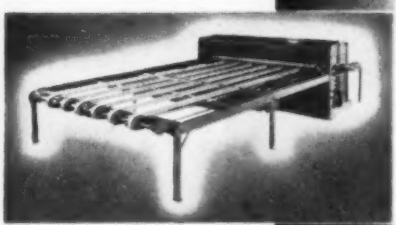
The MODEL 330 Multi-knife AUTOMATIC high production PANEL CLIPPER.
The MODEL 328 CLIPPER for general clipping requirements.
The MODEL 328-A CLIPPER—an automatic clipper for package plants.
The STYLE "W" SIZING CLIPPER for resizing veneer.
The MODEL 331 FOOT POWER CLIPPER for sizing and trimming veneer.
The MODEL 346 HIGH SPEED SINGLE KNIFE automatic clipper.



Model 328-D



Model 330-E

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VENEER and PLYWOOD

OPPORTUNITIES IN PREFAB BUILDING

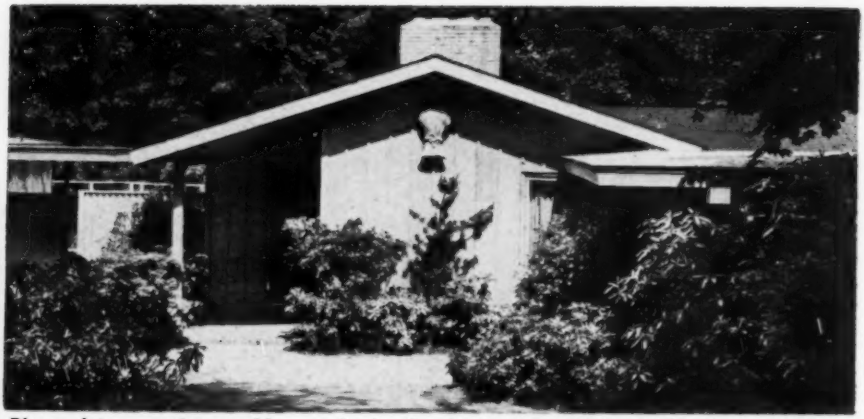
PART 20

By Ned Bailey

In an address last October at the fall meeting of the Prefabricated Home Manufacturers' Institute, in his closing remarks, Dr. Richard U. Ratcliff, professor of Land Economics, University of Wisconsin, had this to say:

"In the past 10 years, the prefab industry has broken through many of the road blocks of inertia, consumer repugnance, building code barriers and labor union reluctance. The road ahead has chuckholes and detours but the speed with which the industry travels toward its goal will largely depend on further developments in industrial organization and business methods which evolve out of the unique requirements of factory building of houses and which represent an integration of the processes of production, financing and distribution. There is no apparent reason why the inherent advantages of prefabrication cannot lead the industry to a position of dominance in home building; in 10 years to the producing of half the homes built; in 20 years, two-thirds, and perhaps most important of all, to a better housed America, in finer, more adequate homes at a lower cost."

THE more I study the present and future of prefab products, the more enthusiastic I become. For many years, and in some parts of the country still, the woodworking industry has been very slow to accept the many new and remarkable materials and machinery offered for its use. This has not been true of the veneer, plywood and pressed board manufacturers. The results of their progressiveness have brought about the production and use of end products from these materials that are a boon to humanity. It is evident now that we have only scratched the surface. The field is unlimited, particularly in view of our ability to combine veneer and plywood with other materials. We can look forward to rapidly adding to our present veneer and plywood products, many new and different items which will have a far greater sales value per unit than what we are making today. These developments will probably be



Plywood is sometimes sold on a basis of price in competition with other materials. More often it is sold on its own merits as a superior construction material of high quality and long-proved-on-the-job performance. The in-place cost of plywood siding is generally lower than that of other high quality siding materials. At the same time, it is adaptable to any architectural style—from modern wide-lap siding to this handsome board and batten treatment.

accelerated by the increasing demands of the military.

The great demand for standard types of veneer and plywood will unquestionably continue to come from the building trades, for residential, industrial and farm use. These various applications have seen many important changes take place, especially in the matter of prefabrication. The present pre-cut and prefabricated method of building has gradually become one of the nation's biggest industries.

To meet the demand for light weight and maximum strength, there are on the market today many combinations of plywood, including those with honeycomb and those with pressed wood cores and metal faced plywood products. From these combinations new uses are being found constantly—sink and table tops for homes, hospitals and restaurants; panels for freight cars; truck bodies; boats; streamlined trains and wall paneling. The interiors of passenger cars and busses are mostly made of plywood. House trailers, underflooring, floor boards, door panels, trucks, suitcases, kitchen cabinets, packing cases and bottle cases are other uses.

Back in August, 1949, we published an article by Tom Perry entitled, "The How of Prefabricated Homes." As an introduction to his article, Mr. Perry said, in part, "Prefabrication is a term that correctly describes much of our home equipment—refrigerators, furniture and the like. It applies equally as well to the automobile, boat and airplane. All these products can be completed in the factory by well developed mass assembly methods and with maximum efficiency."

"Strangely enough, the word did not gain wide usage until it was applied to the prefabricated home or in its abbreviated form, the 'prefab.' Equally curious is the fact that prefabrication is less complete in homes than in the type of products previously listed since one must provide for final assembly and erection of homes at the site.

"The problem of home prefabrication, therefore, becomes one of reducing the field erection to a minimum and re-

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for increasing production of your veneering and laminating operations

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taining all possible work in the factory where efficiency and cost are indisputably favorable."

Mr. Perry's observations, although not as applicable in some respects now as they were then, are still generally appropriate. Many interiors such as closets, kitchen cabinets, sinks, etc. could be made by outside suppliers or manufacturers and assembled on the job. Sash and doors in many instances are supplied to the prefab builder at the site of the building when needed.

From all indications, we are in the midst of an industrial revolution in the housing industry. It is comparatively recent in origin and is due largely to changing economic developments, including constant changing of population centers. It is evolutionary in that it is proceeding slowly. It is revolutionary in that, in time, it will greatly alter the processes of providing shelter. This situation does not apply to prefabrication only, although in the field of technology, the most revolutionary developments are found there. The other center of development is in the field of industrial organization both in and out of the prefabrication industry in its broader sense.

In housing, the prefab industry is in the main flow of this industrial revolution; it has exploited a revolutionary structural system for house construction and it has made a start toward an industrial organization and process which is fitted to the special system of production which is unique in many respects.

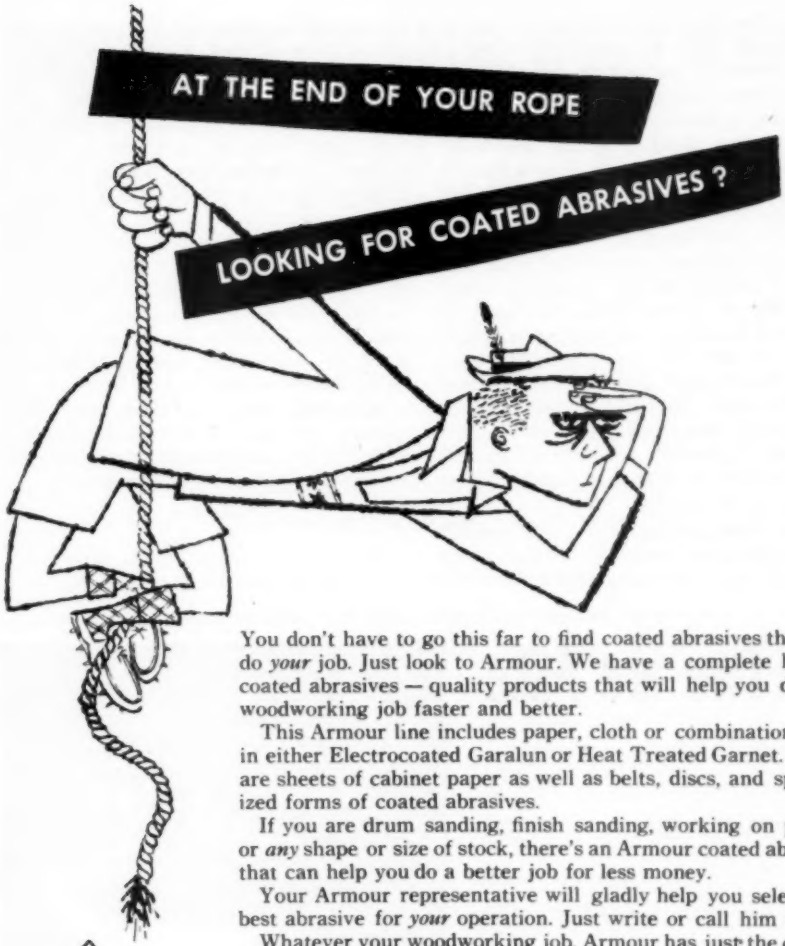
Changes in industrial organization are also appearing in other sectors of the housing industry. Large tract builders are working and perfecting new patterns of operation and have demonstrated that great economies can be effected without resorting to revolutionary structural techniques. It remains for the prefabrication industry to prove that even greater economies are possible

This award-winning plywood wardrobe with the unique shelf arrangement on the backs of the doors is a natural stimulant to building materials sales. Suitable for new construction or remodeling, the design won a built-in competition. Some millwork concerns are fabricating the wardrobe for sale to retail dealers and other outlets. Others are making it in KD form. Either way, it's another use for plywood.

by combining a new pattern of operation with a new method of construction. Just how important a part the precut division of the prefab industry will play still remains to be seen. However, in many parts of the country it is assuming major proportions.

The evident direction of this industrial revolution in housing appears to me to be toward greater vertical integration. The essence of such integration is control and direction, but not necessarily ownership of all the agencies of production and distribution. Here is the place that many of our readers may find an opportunity to step into this business as suppliers of integral parts of the completed structure.

It is a proved fact that the home



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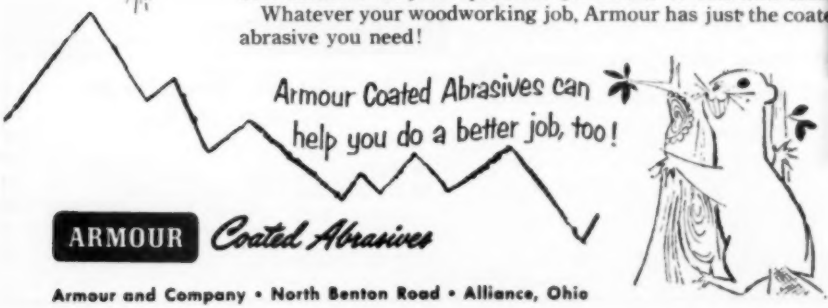

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buyer, the one who finally has to be considered, will be served best by a single point of contact, an overall price and a complete one-stop service in acquiring a home. The producer of the end product must interpret the consumers' requirements in his design, relate design to structural system, guide his suppliers in producing appropriate products, and integrate the whole process of producing, selling and financing with a timing which minimizes cost. The highest of managerial skill is required to effect such timing in order to break with the many existing patterns, habits and institutional barriers and in order to build a new system which will be custom-fitted to the new concept. I sincerely feel that it can and will be done by many, as it is by a few today, in the prefab industry.

The many component parts needed for a complete prefabricated home include work for many segments of the woodworking industry not today engaged in supplying the prefab manufacturer. Much remains to be done in the prefab industry. Factory production of houses calls for methods far different from any existing in a conventional system. From my own observation, these methods are still in the development stage in many respects. Like any new process, it began to use the old methods and devices "same as dad did"—just as they made the first automobiles to resemble carriages. Old forms have failed at nearly every point in both production and distribution; new adaptions have had to be made. In a successful study of these important factors lies the greatest potential for economy in prefabrication where cost can be cut and more sales made.

The End

Anger is a wind which blows out the lamp of the mind.—**Ingersoll.**

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As in peas, so in plywood—no two plywood firms are alike in resources, experience and service.

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We will be happy to quote to you or advise you of the possibilities of utilizing your wood waste.

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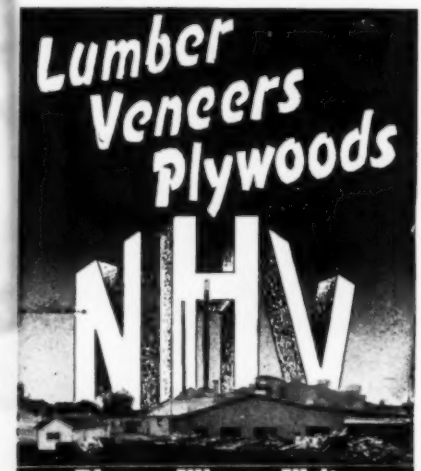

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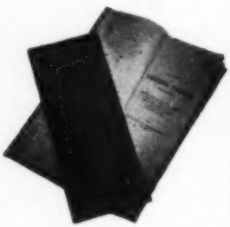

A handy book of accurate tables for quickly determining square feet contents of veneer and the cubic contents of logs, complete to fractional units.

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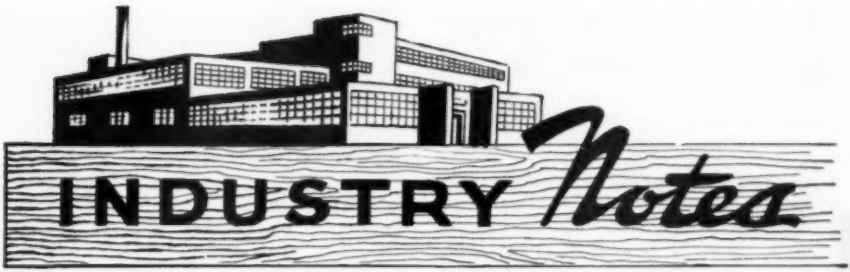


P.H.M.I. ELECTION

John C. Taylor, Jr., New York, N. Y., was re-elected president of Prefabricated Home Manufacturers' Institute at the association's ninth annual meeting. He is president of American Houses, Inc.

Other officers re-elected for the next year were William B. F. Hall, Fort Wayne, Ind., vice president, and Robert E. Ott, Port Washington, Wis., secretary-treasurer. Mr. Hall is president of General Industries, Inc., and Mr. Ott is general manager of the Harnischfeger Corporation (Houses Division).

F.P.R.S. PLANS NORTHEAST MEETING

"Materials For Forest Products Industries" will keynote the technical program of the 1952 spring meeting of the Northeast Section, Forest Products Research Society, scheduled to be held at the Yorktown Hotel, York, Pa., May 22 and 23. Specific manufacturing problems will be handled covering all phases from logging to finishing with experts in each field conducting discussions.

In addition to four plant tours to furniture, pulp and paper and cabinet plants, in cooperation with the York County Furniture Manufacturers Association, the program will include: "Why and Wherefores of Gluing," directed by Thomas D. Perry and with a panel of four adhesive experts; "Wood Abrasives," E. E. Oathout; "Quality Wood Supplies," J. E. McGuire; "Wood in Construction," R. P. S. Johnson. Other subjects to be covered are talks on high pressure laminating, modified woods, materials conservation, kiln drying, finishes and conveyor handling systems.

Advance registrations should be made with F. P. R. S. Sec.-Treas. W. J. Delmhorst, Delmhorst Instrument Co., Boonton, N. J.

OHIO KNIFE

The Ohio Knife Company of Cincinnati is adding 30,000 sq. ft. of production space to its present knife manu-

facturing plant. This current building program is the fourth major expansion made by the Ohio Knife Co. in the past ten years. When this present expansion project is completed, it will

greatly increase the company's capacity for knife production and will aid in handling the consistently increasing volume of business.

CONTINUE MARINE STUDIES

Directors of the William F. Clapp Laboratories, Inc., have announced the election of A. P. Richards as president and director of the laboratories, succeeding Dr. William F. Clapp who died last December. Mr. Richards has been vice-president of the laboratories and principal assistant to Dr. Clapp for the past 16 years.

The Clapp Laboratories were incorporated in 1948 to carry on the extensive work and research in marine deterioration to which Dr. Clapp had devoted most of his life. The nation's armed forces and many industries with interests in marine installations have looked to the Clapp Laboratories for scientific studies of destructive marine organisms encountered in harbors throughout the world.

MONSANTO OPENS THREE BRANCH OFFICES

Three new branch sales offices by the Western Division of Monsanto Chemical Company have been announced. The offices, part of the division's expanded sales program for its Rez resin-based surface coatings and sealers, are at Dallas, Tex.; Atlanta, Ga.; and Cleveland, Ohio. Initial sales representatives at the new offices are Joseph W. Schinzing, Jr., Joseph Phalon and Edward Kuntz, respectively.

PAINT SCHOOL

The Binks Manufacturing Company, 3122 Carroll Ave., Chicago 12, Illinois, announces schedules for its spray painting school. New classes will be held

CLAMP SAW IN VISE
K5 DOES THE REST

Files, sets, joints in one operation

K5 Band Saw Filing Machine files, sets and joints band saws with absolute uniformity. The result will be quickly noticed in cleaner, faster cutting and longer period of service obtainable from each blade.
K5 requires no further attention after the saw is clamped in the vise. The blade is automatically clamped while being filed and set. Its speed is the equivalent of four men working by hand and replaces two separate machines formerly required for this work. For details write for Bulletin on K5 Band Saw Filing Machine. Wardwell Manufacturing Company, 3161 Fulton Road, Cleveland 9, Ohio.

WARDWELL
Maker of the largest line of saw and tool sharpening machines

Every student attending the school takes a spray gun apart then assembles it.

Monday through Friday: May 7 to 11 and June 4 to 8.

Many company officials have found that attendance at the Binks school helps in keeping management more informed. The facts learned at the school about spray finishing will contribute to better and faster decisions. It makes possible the training of key personnel with minimum interruption to production. A company need send only its foremen, department heads or other supervisors. The school teaches these key people the most modern spray painting methods and equipment. When they come back to the plant, they're better equipped to establish more efficient spray painting techniques.

However, enrollment is not limited to officials and supervisors. Anyone who will benefit from the training is welcome.

William Beacham, nationally-known paint chemist and spray painting authority, is in charge of the classes, which are conducted at the Binks plant.

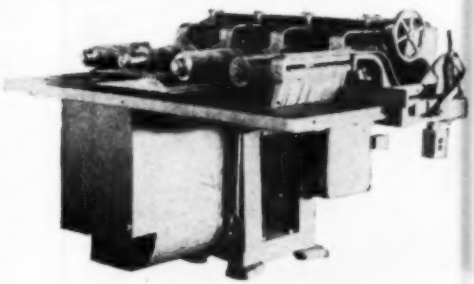
Civil service is something you get in restaurants between wars.

A Real Husky

No. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW

FOR QUICK OPERATION — DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H.P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs. Available for direct motor or V belt drive.



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Write Export Dept. (5)

INTERNATIO ROTTERDAM INC.

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75 Federal Street
Boston 10, Mass.

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San Francisco, Calif.

Hamilton

FACTORY TRUCKS

ESPECIALLY DESIGNED FOR THE WOOD-WORKING INDUSTRY

NO. 800

Cap. 1500 lbs.

Heavy Duty Wheels & Casters

Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.

Write for descriptive circular and low prices.

THE HAMILTON CASTER & MFG. CO.

1800 Dixie Highway Hamilton, Ohio

CONSTRUCTION ESTIMATES

Total construction contract awards in 1951 for the 37 states east of the Rockies amounted to $15,751,131,000 or 8 percent more than 1950's total of $14,501,-055,000.

Non-residential awards for 1951 reached $6,822,513,000 or 31 percent more than the 1950 total. Residential contracts amounting to $6,205,388,000 were 8 percent below the 1950 comparative figure.

Public and private works and utilities had a final total of $2,723,230,000 or 6 percent higher than the total for the previous year.

BUDDY POPPIES

Each year in connection with its annual national sale of Buddy Poppies, the Veterans of Foreign Wars of the United States selects a Buddy Poppy girl to symbolize the many thousands of women and girls—wives and mothers,

daughters and sisters of our country's veterans—who help distribute the mil-

lions of Buddy Poppies to the people of America during the week prior to Memorial Day.

The 1952 Buddy Poppy girl is lovely young Ginger Crowley, 18-year old film actress, daughter of Commander Dennis Stafford Crowley, U. S. Fleet, retired.

"I know what the annual Buddy Poppy Sale means to our country's disabled and needy veterans," said the youthful 1952 Buddy Poppy girl, commenting on her selection, "and I am sure that every patriotic American who has the opportunity to help, will do so generously. To be chosen as the Buddy Poppy Girl, is an obligation as well as an honor, and I intend to do everything I can to help make the sale a success."

All the Buddy Poppies are made by disabled and needy ex-service men in government hospitals, and the entire proceeds of the annual sale during the week of Memorial Day are used for rehabilitation and welfare work.

You cannot bring about prosperity by discouraging thrift.

You cannot strengthen the weak by weakening the strong.

You cannot help little men by tearing down big men.

You cannot help the wage earner by pulling down the wage payer.

You cannot further the brotherhood of man by encouraging class hatred.

You cannot help the poor by destroying the rich.

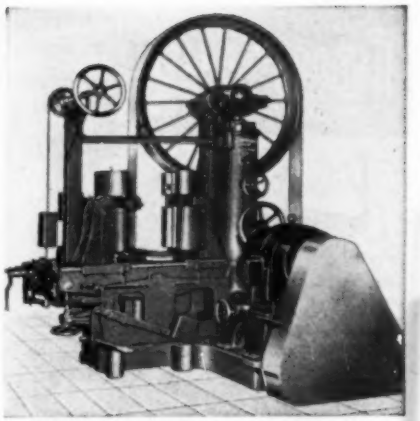
You cannot establish sound security on borrowed money.

You cannot keep out of trouble by spending more than you earn.

You cannot build character and courage by taking away man's initiative and independence.

You cannot help men permanently by doing for them what they could and should do for themselves.

- Abraham Lincoln



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IMPROVED VERTICAL BAND RESAW
- Gear Drive Variable Feed
- Independently Adjusted Feed Rolls
- Write for NEW Bulletin 54 TODAY

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You can heat glue better in

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ELECTRIC GLUE POTS

½ to 11 qt. capacities. Variable thermostat, removable inner liner, brush wiper, 110-v. A-C.

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105 N. CHESTNUT ST. • RAVENNA, OHIO

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INDUSTRIAL FLOOR TRUCKS

for Every Materials Handling Purpose

No. 327 — Hardwood body and stakes, steel tie rods in frame, welded steel sockets.

No. 423—Tilt top style. Hardwood deck, "all-welded" steel frame. Lattice end racks.

No. 749—"All-welded" steel Jig Skid. Can be tailored to your specifications. Upright posts used as gauge.

Semi-live Skid moves, stores, delivers product WITHOUT RELOADING. Assures Continuous Production, Activated Storage, Accelerated Shipment.

For details write for bulletins

TOWSLEY TRUCKS, INC.
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High Speed* HANGER BOLT *DRIVING . . .

A FAST OPERATION TIMED IN SECONDS!

This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. (It is not necessary to stop rotation at any time.)

- AUTOMATIC TAKE-UP FOR WEAR ON JAWS
- REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
- AFFORDS ACCURATE PROJECTION HEIGHTS
- USE WITH ANY AIR OR ELECTRIC DRILL OR DRILL PRESS

Write for Free Literature, TODAY!

TITAN TOOLS

TITAN TOOL CO.
Production Tools
49 Main St. FAIRVIEW, PA.

Appointments

Garvin A. Drew has been appointed assistant vice president of the Scovill Manufacturing Co., Inc., with respect to the affairs of the Schrader Division. He will continue in his capacity as general sales manager.

Garvin A. Drew

T. J. Connelly

T. J. Connelly was elected president of the Dean Company, Chicago, at a special meeting of the board of directors. He succeeds the late Philip D. Dean. The board of directors also elected **Charles D. Dean** of Norfolk, Va., former vice president and treasurer, as vice chairman of the board, executive vice president and treasurer of the company. **L. R. Sandberg**, Chicago, former assistant treasurer, was made secretary.

N. W. Embry has been elected chairman of the board of General Box Company. **J. A. Cragwall**, vice president and manager of the Kansas City Division is now president. **Roy E. Welch** has been promoted to manager of the Kansas City Division.

Miss Jessie May Smith of the American Resinous Chemicals Corp., Peabody, Mass., has been appointed administrative assistant to the president. Until recently she handled their sales promotion correspondence.

Douglas Fir Plywood Association, Tacoma, Wash., announces that **Richard W. Pettersen**, Portland, Ore., has joined their allied products department. Pettersen is a specialist in wood tech-

nology and a former "smoke jumper" with the U.S. Forest Service. In his new work he will play a part in the expanding program of the allied products division which handles product testing and promotion of fir plywood specialties.

L. M. Muse

D. S. Gaarder

Two headquarters promotion in the General Industrial Division of the Sherwin-Williams Company have been announced. **D. S. Gaarder**, formerly assistant general manager, is now manager of the New Products Department of the division. He will direct the development and marketing of major new products. **L. M. Muse** has been appointed manager of the Branches Department of the General Industrial Division. His new duties involve the training and sales support of branch and regional personnel.

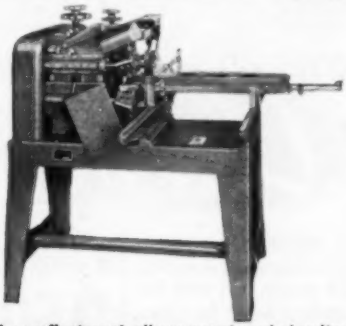
WESTERN PINE ANNUAL MEETING

More than 300 members of the Western Pine Association concluded their annual meeting recently at San Francisco. Re-election of three officers, adoption of standardized casing and base moulding patterns, minor grading rule changes and approval of increased participation in a national woodwork promotion program were matters of business transacted.

The lumbermen, drawn to the Bay City from throughout the 12-state Western Pine region, also heard their president, Walter S. Johnson of San Francisco, report that industry production in 1951 set a new record and that association membership again showed an increase last year.

HARRIS

DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy.

MILLBURY MACHINE COMPANY
13 WATERS STREET MILLBURY, MASS.

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WASHERS - BLANKS STAMPINGS

Your most dependable source of supply—the world's largest manufacturer of Washers, serving industry since 1887. Over 22,000 sets of Dies.

Submit your blueprints and quantity requirements for estimates.

WROUGHT WASHER MFG. CO.
The World's Largest Producer of Washers
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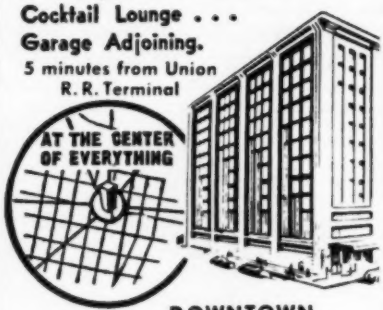
A splendid location in the heart of Downtown Los Angeles. 555 delightful rooms, all with all modern hotel facilities. FROM $3.50

Outstanding Food — Ye Old Oak Tavern; also popular Sub-Marine Cocktail Lounge . . .

Garage Adjoining.

5 minutes from Union R. R. Terminal



DOWNTOWN AT PERSHING SQUARE

Los Angeles

426 S. HILL STREET

JOHN T. LOCHHEAD — M. E. MALTBY — MANAGING OWNERS

"Shipments, however, were off approximately 6.5 percent," he said, "and prospects for 1952 indicate a further decline, although it may be slight, from that figure."

S. V. Fullaway, Jr., secretary-manager, admonished members not to forget their civic duties. There is abundant evidence, he said, that too many businessmen are being lulled into complacency by our temporary prosperity and fail to realize that 1952 is to be a most crucial year for this nation.

"They are apparently unaware of what seems obvious to others—that the outcome of this year may well determine whether our free enterprise can survive," he said.

W. E. Griffee, assistant to Fullaway, said the Western Pine industry could look forward to a 1952 shipment volume approximately 15 percent under that of last year, although admitting that it is an especially difficult year for which to make a prediction.

Griffee pointed out that residential construction in the year ahead cannot be forecast by ordinary standards and that government purchases have not yet become an important factor in the market.

Adoption of a group of standardized Western Pine casing and base patterns came as the result of a year-long series of meetings throughout the pine region to agree upon consolidation of the many contours and sizes produced in the various sections. The new patterns will be known as the 300 series. Pattern sheets will be published by the association soon.

The association also approved clarification of the moulding grading rules to limit the amount of under-8-foot lengths to 15 percent in any one item.

The group's board of directors voted to increase Western Pine participation in a joint wood window and panel door promotion program inaugurated more than a year ago in cooperation with sash and door manufacturers. It will provide a stepped-up general advertising and promotion campaign.

Forest conservation action included decisions to sponsor a tenth anniversary

Tree Farm program this year, contribute to Keep Green programs in seven states, and to request industry representation in planning for a government reappraisal of the nation's forest resources scheduled for 1955 "in order that the many mistakes in the 1945 resurvey will not be repeated."

Continuation of the association's consumer and trade advertising program, now in its 29th year, was also authorized.

The association re-elected Johnson to the presidency and re-installed U. R. Armstrong, Winchester, Idaho, as vice president and C. T. Gray, Stockton, Calif., as treasurer. Bruce Elmore of McNary, Ariz., was named to the other vice presidency. Semi-annual meeting of the association was set for Portland in early September.

It would seem the surest way of solving the steel shortage would be to melt down the Iron curtain.

Find out how Woodsman Carbide Tipped Saws can give your Real Savings and More Profit.

A Saw To Fit Every Service Need

16 different styles of Woodsman carbide tipped blades for any application, guarantees more efficient and profitable saw operations.

Styles available are:

Planers	Trimmers
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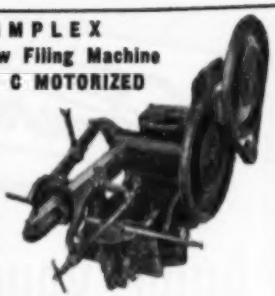
SIMPLEX
Band Saw Filing Machine
MODEL C MOTORIZED



The Simplest machine of its kind made, works automatically and requires no attention after being started. Files old saws with uneven teeth as perfectly as new saws, teeth being filed evenly and to a uniform height.

All movable parts are operated by but **one shaft** — everything **simple, durable** and **dependable.**

Self-opening Vise and new improved slide and bearing. Solid construction — no vibration.

Requires but a few moments to adjust the saw and the machine.

Will take in band saws ⅛"—1¼" in width with spacings from 7/64"—⅝", point to point.

Uses ordinary 6" taper saw files.

Plug Into Any Electric Light Socket

Equipped with heavy duty ¼ H.P. single phase A.C. 60 cycle 110 volt ball bearing ventilated open type motor. Driven by two V belts.

Cord, plug and switch supplied as standard equipment.

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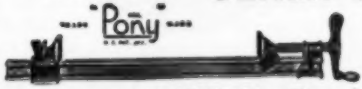
"Jorgensen" **CLAMPS**

"Pony"



Style No. 70 "JORGENSEN" I-bar Clamps for greatest strength, fast operation, and economy.

Style No. 50 PONY Fixtures make ideal bar clamps on black pipe — any length.

"JORGENSEN" "C" clamps are built to take hard service, at low cost.

Genuine "JORGENSEN" Handscrews — hard maple jaws, steel spindles. You can depend on them.

ADJUSTABLE CLAMP COMPANY
"The Clamp Folks"
418 N. Ashland Avenue
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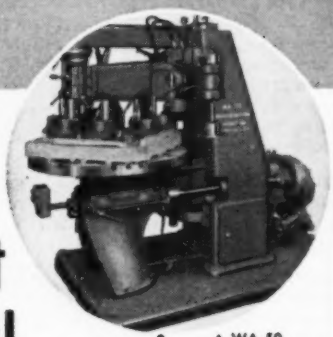
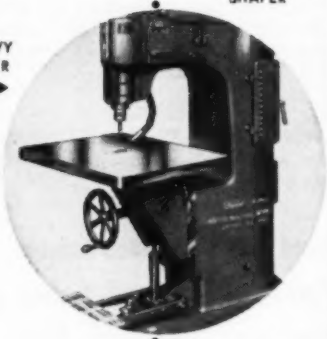
Onsrud®

builds your output ...cuts your outlay!



↑ WA-50 AUTOMATIC SHAPER

W-244 HEAVY DUTY ROUTER →



← W-180 MEDIUM DUTY ROUTER

It's no secret. Onsrud's world-famous high speed routers and shapers DO cut production costs—by the simple process of turning out more and better work in less time.

Whether you have highly specialized jobs, or straight run-of-the-shop work, there is an Onsrud machine that can handle it more quickly and easily for you. Whether the runs are long or short, the parts big or small, Onsrud builds your output . . . cuts your outlay!

We'll be glad to send you free literature on all Onsrud high speed woodworking machines, as well as delivery information on particular models. Write or call today.

ONSRUD MACHINE WORKS, INC.

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Know your wood

HEMLOCK

BY NED BAILEY

A MEMBER of the pine family, hemlock is of ancient origin. Remains of leaves, cones and wood have been found in early geological strata of America and Asia. Of the nine known species, four are found on this continent, two being native to the eastern states and two to the northwestern mountains.

I feel that quite often too much emphasis is placed on relatively small differences among species, while the variability in properties of wood of the same species is largely ignored.

To some extent, lack of uniformity is a property common to all materials. However, wood has probably a greater range of variability than other structural material. It is essential therefore that the extent and the significance of variability in wood properties of the same species be known. Variability within species comes largely as a result of environmental influences affecting the growth of trees, including such factors as climate, soil, moisture and growing space. Also, it depends on hereditary characteristics, though the latter factor has as yet received but scant attention in handling of forest trees.

The four hemlocks native to this country are more nearly alike in every respect than most other species found here, their geographical location and commercial value being their principal differences. Eastern hemlock is found throughout the northeastern states from northern Maine to northeastern Minnesota, south through Wisconsin, southern Michigan and Indiana on thence southward along the mountains from Pennsylvania and West Virginia to northern Alabama and Georgia.

Carolina hemlock is a comparatively rare tree. It is found along rocky banks of streams in the Blue Ridge mountains of the Alleghenies from southwestern Virginia through western North Carolina into northern Georgia at elevations of from 2500 to 3000 feet.

Western hemlock and mountain hemlock are found in the same general area from southern Alaska south to central California, inland as far as northern Idaho and northwestern Montana. Western hemlock grows at from 1500 to 3500 feet and mountain hemlock, which grows also in Washington, is found from 5000 to 11,000 feet elevation.

Here is a species that has in common the fact that its wood is good for paper pulp mostly although it is used locally for staves, boxes, crates and building material construction. The bark, branches and leaves are very valuable for tannin and dyes. These uses are regulated by the geographical location which in turn affects the growing habits which occur within the species.

There are probably more eastern hemlock than all the other hemlocks put together. With its irregular crown of dark green foliage, its slender gracefully drooping leader and massive

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Technical Advice for your HARDWOOD LUMBER PROBLEMS

Leading manufacturers use **REISEN'S** know-how to improve their products and reduce costs . . . our staff of graduate technologists is at your service to help you eliminate wood production difficulties.
Carload and truckload shipments direct from our ultra-modern dry kilns assure you of the finest at the lowest prices . . .

IMPORTED WOODS: Mahogany • Teak • Dabema • Limba • Banak • Rosewood • Lignum-Vitae.

DOMESTIC WOODS: Ash • Basswood • Birch • Oak • Cherry • Maple • Poplar • Walnut • Beech • Sycamore

REISEN Hardwood Lumber Co.
1081 Morris Ave., Union, New Jersey
Phone: New Jersey—Elizabeth 4-1500
New York—Worth 2-2876

trunk, the eastern hemlock is a feature of the forest and open country on cool, moist slopes and in well drained, fertile valleys throughout the northeastern states.

Of relatively slow growth, it reaches maturity in 250 to 300 years and often lives for 600 years or more. Most eastern hemlocks grow 60 to 80 feet high and 2 to 3 feet in diameter although there are many instances where heights of 160 feet and trunk diameters of 6 feet have been measured.

The leaves of the hemlocks are all very interesting, particularly the eastern hemlock which is to a large extent typical of all hemlocks. The flat, narrow leaves, or needles as they are usually known, are one-third to two-thirds of an inch long, rounded or minutely notched at the end, shiny, dark green above, light green below and marked with two parallel white lines of white dots or stomata, small mouth-like openings beneath. Each leaf or needle grows on a thread-like stem or petiole, and while borne spirally on the branchlets, they appear to be two-ranked, like a flat spray. The early spring foliage is a delicate, light yellow-green contrasting with the darker green of previous years. The needles or leaves as they are called remain on the twigs for three or more years and upon falling, the base of the petiole (leafstalk) remains, giving the twig a roughened appearance.

Early in May each tree bears separate male and female flowers on twigs of the previous year. Blossoms appear on all parts of the tree from top to lowest branches. By the end of October of one season the fertilized ovulate flowers develop into broadly oval, green to purple cones which become reddish brown as they reach maturity. These are among the smallest of all tree cones, one-half to one inch long.

Deeply divided cinnamon-red to brown bark covers the rapidly tapering trunks of mature trees. On eastern hemlock the bark is from two to three inches thick, broadly ridged and covered with fine scales. The bark often comprises 15% to 19% of the cubic volume of a tree. The value of the tannin in the bark was for years so great in comparison with the lumber that great trees were frequently left to decay in the forest after the bark had been removed.

The bark is peeled off in rectangular sheets about four feet square and is still so greatly in demand by the leather industry that lumbering operations are usually confined to the spring and summer when for some reason the bark will "slip" off easily. About 100,000 tons of bark are produced each year.

Of comparatively recent years, the light buff, soft, coarse-grained wood of the eastern hemlock has become of increasing importance as lumber. It weighs only 28 pounds to the cubic foot when air-dry, is practically without taste or odor and is used for boxing, crating, food containers, general construction and railroad ties. Hemlock possesses unusual power to hold nails and spikes. Its greatest value, however, is as a source of chemical pulp for the manufacture of paper. Being light colored (almost white) it is often made into wood flour.

There is an estimated stand of eastern hemlock well over 12,000,000,000 board feet with an annual production of about 700,000,000 board feet.

Western hemlock is similar in many respects to the eastern hemlock. It is larger, however, and grows faster. It is found along the northwest Pacific coast mostly at elevations about 1500 feet, in some cases to 6000 feet. Western hemlock attains heights of 150 to 250 feet and trunk dimensions of 8 to

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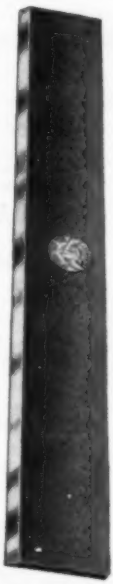

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10 feet. Unlike the eastern type, western hemlock reproduces freely under a variety of conditions and while the seedlings can endure dense shade, they grow more rapidly in the sunlight.

The bark is not as thick as eastern hemlock, being about one and one half inches on adult trees. However, the bark is much richer in tannin by 12% to 15% as compared with 10% to 13% for the eastern variety. The heartwood is slightly heavier and harder and stronger than the wood of the eastern hemlock, is less splintery and because of its soft, fine, non-resinous texture and straight grain is finding an increasing demand in commerce. The wood has one amazing feature. It is relatively resistant to attacks by termites, but it is not too durable when used untreated under conditions that favor decay. When properly dried, it is suitable for all but the heaviest construction jobs and is extensively used for framing material, house sheathing, planing mill products, boxes, barrels, railroad ties, concrete forms and is rapidly becoming one of the most important pulp woods grown on this continent.

The total stand of western hemlock is estimated to be about 150,000,000 board feet with an annual cut of about 700,000,000. Its ability to withstand shade makes it desirable for ornamental purposes, but it does not thrive to any extent outside its present habitat.

Carolina hemlock growing in a comparatively restricted area as previously described, is not of particular value except in that area. It is small, growing to about 60 feet in height and the trunk rarely larger than two feet in diameter. Generally speaking, it has practically all of the identifying marks of the hemlocks previously described. The bark

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has considerable tannin content but is thin. The timber has really very little commercial value, the principal uses being for building construction, boxes and crates, the wood being also suitable for the manufacture of paper pulp by the chemical process. It is a choice ornamental tree having the advantage over other conifers in that it grows well in the shade.

Mountain hemlock, found principally in the Pacific northwest, is the sturdiest member of the family. It thrives best 4000 or more feet above sea level. Like other timberline trees, mountain hemlock is usually short and distorted, reaching only about 60 feet high and 10 to 20 inches in diameter. In protected spots, on gentle slopes, they do grow better, sometimes reaching 150 feet with trunk diameters of up to 3½ feet. It is without special strength and is used locally for cabins and rough log shelters. As noted before, mountain hemlock is a tree of unusual beauty but suited best for ornamental planting in cool, moist soils in the northern Pacific states and in the east as far north as Massachusetts.

NEW MANUAL ON AIR AND HYDRAULIC CIRCUITS

A 32-page, pocket-size manual "The Circuit Rider," presenting a discussion of basic designs in fluid power circuits together with drawings, is announced by Logansport Machine Company, Logansport, Indiana. The company has designed and manufactured Logan fluid power production equipment for industry since 1916.

In preparing this manual, the company has endeavored to bring to industry a down-to-earth explanation of representative types of fluid power circuits and to show the many possibilities afforded through the use of different types of circuit designs.

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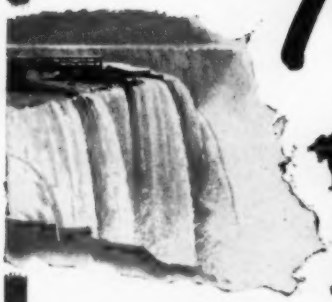

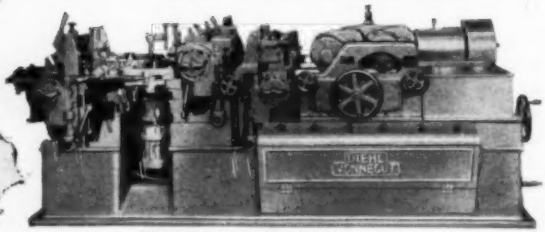

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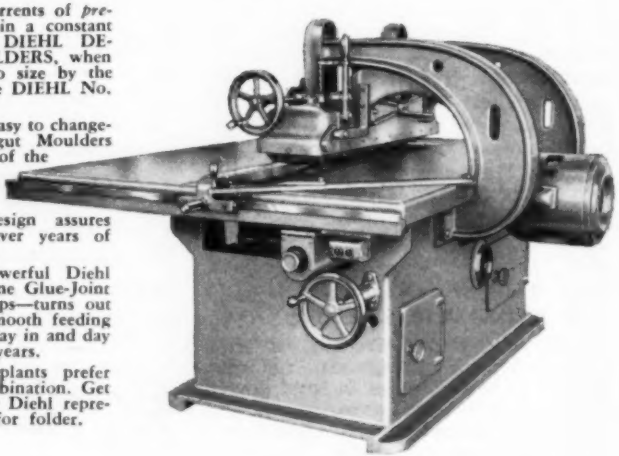

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F. P. R. S. Notes

"STUMP THE EXPERTS"

Are you looking for practical answers to your problems? If so, the Forest Products Research Society tells us that you should be able to get some solutions from among the 50 speakers scheduled for the society's sixth annual meeting at Milwaukee, Wisconsin, June 23-26. We are presenting eight of them in this issue of WOOD WORKING DIGEST. Next month we plan to carry the entire program and other pertinent data.

E. G. Wiesehuegel

Robert A. Holcombe

Harry H. Steidle, manager of the Prefabricated Home Manufacturers' Institute, in "The Possibilities of Forest Products Research in Home Fabrication," says, "Many industrial applications for materials developed through forest products research may command higher prices, but the unlimited sources of raw material, combined with the high capitalization of conversion plants, will require a mass market and there is none more ready for cultivation than the field of prefabricated housing."

John D. Cochrane

Richard M. Connor

Philip L. Northcott

Harry H. Steidle

The trend is toward production of larger panels or sections with less work being done on the building site. Finishes used in tomorrow's homes are predicted to be scratch-resistant.

Jerome F. Saeman

Robert W. Hess

John D. Cochrane, director of research and development for the Formica Company, Cincinnati, Ohio, is to speak on wood waste core materials. These materials, he says, have a two-fold application for the wood industry: 1) as a core to be incorporated within the laminate in the pressing process and 2) as a core on which the decorative

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laminate is veneered by the gluing process. Both applications require special properties and Mr. Cochrane's work with a staff of 54 has helped develop the answers to getting the necessary properties.

"The Development of the Glueline-Cleavage Test," is to be discussed by Philip L. Northcott, in charge of the plywood unit of the Vancouver Forest Products Laboratory. Efforts to reduce the variability encountered in testing wood-to-wood bonds and a new method of testing glue lines are described.

Various means of packaging and handling lumber, dimension and hardwood flooring in a furniture factory and flooring plant will be discussed by Richard M. Connor. Labor saving devices and their influence will be emphasized.

E. G. Wiesehuegel is chief of the Forestry Relations Branch, Tennessee

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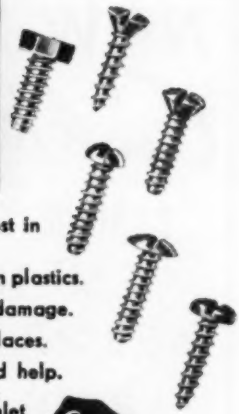

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Valley Authority. He will summarize TVA's efforts to develop a test method of converting low grade hardwood trees and logs into high grade laminated lumber.

During the past year, more than 100 species of tropical woods have been introduced into this country. Most of these were intended for the manufacture of plywood and veneer. It is believed safe to predict that few of these woods will get beyond the trial stage in this application. Dr. Robert W. Hess will report on the woods with reference to their use for veneer and plywood.

Robert A. Holcombe, a chemist of the Timber Engineering Co., Washington, D. C., will discuss results of a research project on the surface checking of veneered furniture panels as carried out by that company.

The chemical utilization of wood waste is a subject of constant interest to the forest products industry. Dr.

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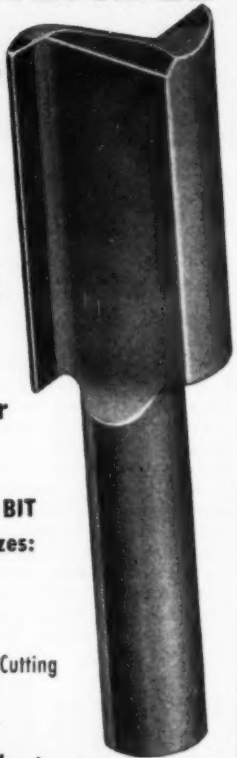

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Jerome F. Saeman will present a paper on this subject. He says about wood waste, "Its utilization would be of much value in improved forest management."

These eight papers give an insight into the type of subject matter that will be presented at the national meeting in June. They are representatives of the more than 40 additional papers which make up the program.

About the only voice a man gets in his family affairs is the invoice.

G.E. NEW LINE F. H. P. MOTORS

A new line of fractional horsepower motors embodying an entirely new concept of motor design and manufacture has been announced by the General Electric Company's Fractional Horsepower Motor Department, Schenectady 5, N. Y.

Designated as "Form G," the new motors are the result of nearly a decade of developmental engineering and research, and incorporate many radically different and advanced design features.

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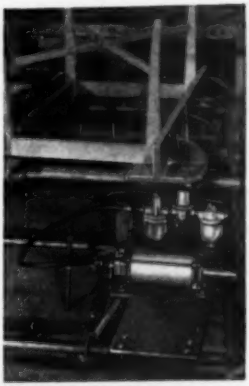
CUTS GLUING AND CLAMPING COSTS WITH AIR

An ingenious portable gluing and clamping device, powered by a Bellows Air Motor, has cut costs in many cases 25% to 50% at Imperial Furniture Co., Grand Rapids, Michigan. The unit is not only portable but adjustable to enable it to handle a wide range of sizes. Automatic operation has meant an immense saving in labor fatigue. The installation is fully described in Foto Facts File FF48-686, free on request. Write The Bellows Co., Dept. WD552, Akron, Ohio.



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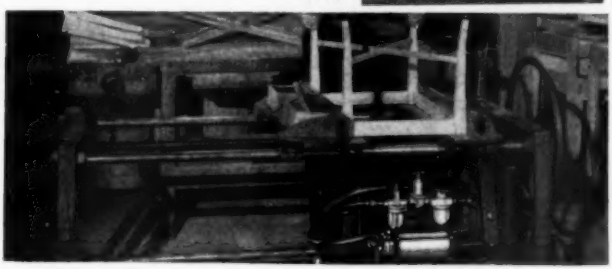
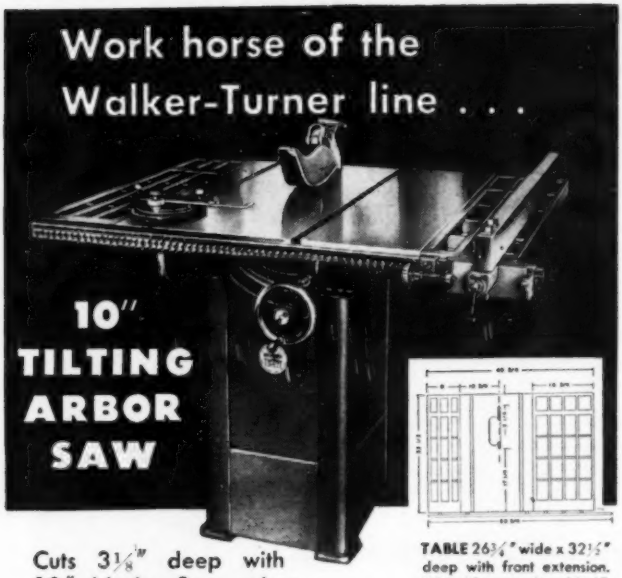


According to G-E engineers who worked on the project, the Form G motor weighs as much as 51 percent less per horsepower than the models it replaces, and is considerably smaller in size. At the same time, its versatility of application has been broadened and its appearance modernized.

The motors are available in open drip-proof and totally enclosed fan-cooled models in Types K (polyphase), KC (capacitor start), KH (split phase), and KCP (permanent split capacitor). These have hundreds of applications—on pumps, fans, blowers, compressors, office and home appliances, motorized tools of all sorts, etc. The design principles ultimately will be adapted to motors for more specialized uses as the Form G line expands, the engineers said.

The Form G also makes more efficient use of existing materials, and features a long list of design "firsts." Among



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Being smaller and lighter, the Form G permits installation of maximum power in minimum space. Its use also decreases transportation and storage costs on motors and motorized devices, makes handling easier in factories and warehouses, and eliminates the need for heavy mounts on machines.

BELTING CATALOG

Newly released by the Graton & Knight Co., Worcester, Mass., is a 40-page catalog and manual featuring leather belting. The theme of the catalog is "More Production Power," a subject that is particularly timely.

This new catalog describes the proper belt for every installation, how to get longer life from belting, how to make a belt endless—plus, of course, the usual listing of sizes, prices and specifications, all indexed for quick reference.

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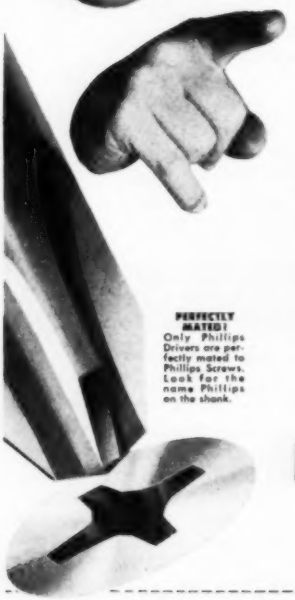
AIR CONTROL VALVE

The Bellows Co., 230 W. Market St., Akron, Ohio, offer a bulletin on their Electroaire explosion-proof valve. This valve is a modification of the original Bellows Electroaire valve first introduced five years ago.

This valve is a complete "packaged" air control unit, consisting of a four-way directional slide valve, solenoid controls and piston speed regulators. It is designed to eliminate down-time often caused by power solenoid failure. One of the features of this valve is the 8-volt solenoids to direct the full pressure of the incoming air to the work of shifting the slide valve. The one major moving part is a lightweight stainless steel piston, with unusually large bearing surfaces, traveling in a mirror-finished bronze cylinder.

Complete description of the valve is given in their bulletin along with a number of illustrations which explain the mechanics of the valve.



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Is AN ACCIDENT-FREE RECORD *Possible?*

Note: A series of 18 questions were sent to panel participants prior to the meeting. The most widely applicable answers were chosen and presented at this session of the 1951 National Safety Congress.

Participants:

R. E. Johnson, Personnel Supvr., Kroehler Mfg. Co., Bradley, Ill.

Kenneth C. Neils, Safety Dir., J. Neils Lumber Co., Libby, Mont.

L. R. Schoenig, Safety Dir., Curtis Co. Inc., Clinton, Iowa.

Q. 1. Does the typical type of safety program work in the wood products industry, or must some different type of safety program be used?

A.—Schoenig: The fundamentals of safety are the same in most industries and we believe that the safety program that includes these will serve the wood products industry very well.

Q. 2. Are there any conditions or peculiarities which make wood products safety programs difficult?

A.—Neils: The safety program in a wood products industry is quite complex, necessitating as flexible a program as possible. It must adapt itself to continuously changing factors such as the following:

1. Weather: Logging and manufacturing of both treated poles and lumber is on a year-round basis. Summer heat, winter cold with snow and ice, spring mud, all these create hazards which make the wood products industry as dangerous a place to work as any in the nation. This problem of weather is never overcome. At best, a good safety program can reduce accidents by applying every known and practical remedy to specific problems and by constant education of the men, making them aware of the environment in which they work.

2. Heavy equipment: In all individual operations from the tree to finished lumber, there is the constant problem of using equipment as an aid to hand labor. Power saws with sawyers; yarding with tractors or high lead systems in conjunction with the rigging men; cranes working in the immediate presence of hookers—each operation having men and equipment working together, wholly dependent upon one an-

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other. The failure of either results in accidents and lost production.

3. Working conditions: Logging is necessarily done in the woods; and in the woods, there is always an existence of hazards such as steep slopes, bad ground conditions, falling trees, snags, etc. Long hours each day caused by driving long distances to the operations tend to lessen alertness and productivity of the men. These and other problems must be dealt with, each new operation having its own new and peculiar problems.

4. Personnel: The wood industry has more steady employees than formerly due to the fact that year-round operation has replaced seasonal work. There are more married men working in the industry, having homes, families and local ties. But there is still a heavy turnover of men causing more problems. Breaking in new employees, inexperienced men on heavy equipment, with the resultant reduction in production. Another problem is then acquired when hi-balling methods are used to increase the production to compensate for the lag caused by the new employees.

Q. 3. How long a period have you had a safety program?

A.—Neils: The J. Neils Lumber Company safety program has been active since 1941.

Q. 4. What was the last bad accident in your plant or operation, and what was its cause? What remedies were used?

A.—Johnson: Our last bad accident in Plant 3, Kankakee was on the date of December 5, 1949, at 11:15 A.M. The accident clipped off the ends of two fingers of the left hand.

How did it happen? Operator was applying side pressure to several pieces of wood as he was running them through the match saw. The outside board kicked back and the fingers of his left hand slipped under the guard, cutting the tips of the index and middle fingers.

The cause? Upon investigation, the cause of the injury was listed as "dangerous practice" because of the side pressure that was being applied during the cut. The cause of the kick back may have been due to a number of reasons such as a worn match saw table top, dull saw or a poor set, etc. Most likely it was caused by the side pressure that caused the saw to bind.

Measures we took to prevent similar accidents. We impressed upon the operator the fact that he should not use side pressure after the cut is started. A new top was put on the match saw table and we checked the condition of the saw.

Q. 5. What sources motivated the

adoption of a safety program which enabled you to set the safety record your plant has maintained?

A.—Johnson: Some of the reasons for adopting a company-wide safety program in the Kroehler plants are as follows: (a) Employee welfare and good will needed to be improved. First aid department with a registered nurse in charge was set up. (b) Our safety record was not good. In some of our plants the frequency rate was excessive. (c) A thorough cost analysis was made which showed our accident cost was too great. (d) As a leader in production, we wanted to be a leader in safety as well.

Q. 6. Who does management hold responsible for safety in your plant and how?

A.—Schoenig: In the Curtis Companies' organization, management holds itself responsible for safety primarily. The safety program is administered through the personnel manager, the safety director, the foremen, the safety committee and inasmuch as our general safety rules are a condition of employment, every person in the organization has a definite obligation.

Q. 7. What is your present frequency rate? Severity rate?

A.—Schoenig: Frequency rate 0. Severity rate 0. (Figures given as of October 1, 1951.)

A.—Johnson: Frequency rate 0. Severity rate 0.

A.—Neils: Up to the end of June, the logging frequency rate was 43.85; manufacturing rate was 25.21.

Q. 8. Which of the above is most important to maintain?

A.—Neils: The frequency rate is by far the most important to maintain. It gives a more intimate review of the accidents, and shows the immediate results of accidents. The severity rate is best for showing the long range trend. But the best of all are the immediate accident reports which keep it on the human basis where a man can investigate and correct. Numbers and figures throw a new influence on the case and make it appear that things had to happen.

This panel discussion on why some woodworking companies have accident-free records was held at the last National Safety Congress and is reprinted with permission.

(To be Continued.)

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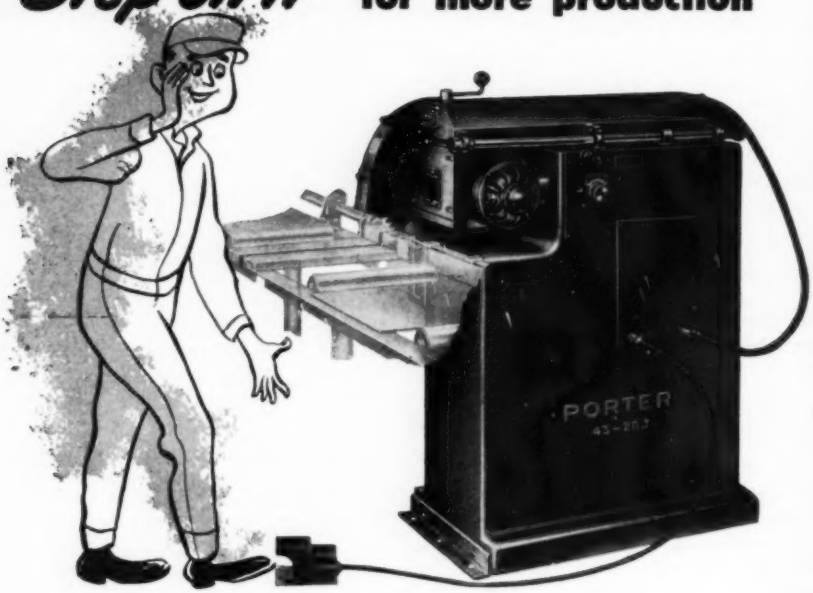

PORTER 43-20J Automatic Hydracut Saw

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Increase lumber production in your plant with these Hydracut Saw set-ups.

1.

Standard Set-up. Hydracut Saw and tables.

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Hydracut Saw in single line conveyorized rough mill set-up.

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Hydracut Saws in double line conveyorized rough mill set-up.

The Porter 43-20J Automatic Hydracut Saw saves hours of labor . . . enables any cutting room operator, regardless of age, to cut more lumber per day by eliminating tiring hand operation. Operator simply positions the lumber against the adjustable cut-off stops . . . and presses the electrically operated foot control. The saw blade, mounted on a hydraulically operated carriage, *automatically* moves forward to make the cut and *automatically* returns. Fatigue from manual "push-pull" operation is gone.

Stroke length is quickly adjusted by a convenient lever. Cutting speeds range from 0 to 45 cuts per minute.

The new Porter Bulletin 43-20J-1 fully explains the Automatic Hydracut Saw. *Send for your copy today.*

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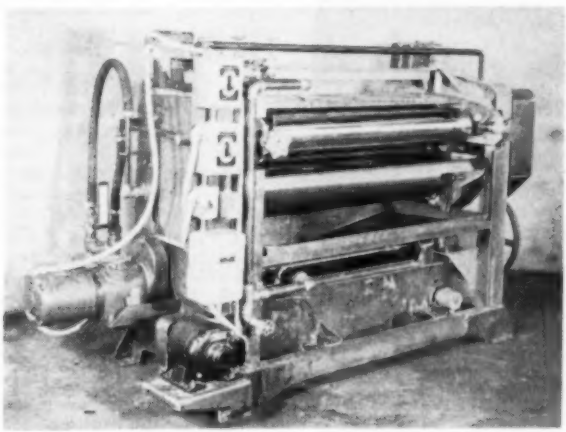
EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

COATING MACHINE



A precision spreading machine is now available from Black Brothers, Mendota, Ill., equipped with integral heat for temperatures up to 250° F. to coat materials up to 120" in width at lineal speeds up to 400 feet per minute. The heat is supplied to the applicator rolls by means of forced water circulation from the water jacket of the supply tank within the lower frame. Heat is supplied by highly efficient immersion type electric heaters arranged for either single or polyphase electric supply and is thermostatically controlled. The lower supply tank furnishes coating material to the roll fountains (reservoirs) by means of a motor driven pump and the circuit can be arranged at will for either continuous circulation with gravity return to the supply tank or intermittent supply as required.

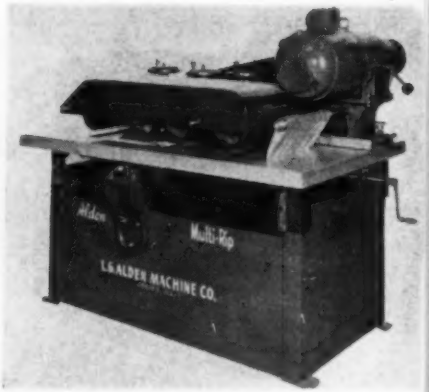
A variety of applicator roll surfaces and materials are available to apply an accurate coating of material in all coatable viscosities and most consistencies without formula modification. Sizes, sealers, glues, cements, stains, var-

nishes, lacquers and paints can be readily applied with no loss of material. Cartons have been lightly waxed for water resistance and pads heavily waxed for scuff resisting qualities. The machine is also available arranged for steam or gas heat or for water cooling.

ALDEN RIP SAWS

The L. G. Alden Machine Company, 314 Henderson St., Joliet, Ill., is offering an improved self-feed, multi-purpose rip saw. It is designed for gang, single and all purposes straight ripping. The machine is of all steel construction and has powerful and positive feed, above and below stock. Each feed roll is power driven and individually adjustable, providing a firm and even pressure.

The saw is made in two models. Heavy duty model No. 12 is capable of ripping through 3" thickness with 14" diameter saw blades with a full width of 12" saw space. Saws operate on 2½" diameter sleeve. The feed has a separate 2 h.p. gear shift with four



rates of speed—approximately 48 to 200 feet per minute. Equipment includes a full set of spacing collars for saw arbor, full set of sectional corrugated rolls and spurs for all feeds, all guards and necessary wrenches.

The standard model No. 12 has a 46" x 36" table. The feed upper rolls are 6" in diameter spur, corrugated or smooth, power driven rotating in precision bearings and mounted in independently adjustable yokes with separate spring tension adjustment to each yoke and driven by standard steel roller chains and hardened sprockets.

BABY DRY KILN

A "baby" lumber dry kiln to be sold as a complete packaged unit—easy and cheap to erect—and believed to be the first of its kind designed specifically for the smaller units of the woodworking industry, has just been announced by the Guthrie Dry Kiln Co., Inc., Spokane, Wash. As in the larger size kilns manufactured by this company, a new patented air-conditioning process for drying lumber is utilized.

This kiln, which can dry or redry lumber to a moisture content of approximately six percent in average time, is constructed to hold four to five thousand board feet of lumber. Except for its size, which is 12 feet in width by 32 feet in length, it is constructed with the same materials and

Talk to the men who use them:

No. 36 BAND SAW SWAGE
No. 10 BAND SWAGE SHAPER

When you talk to men who use these two great tools, you'll find unusual enthusiasm. Most often, expert saw fitters praise these Hanchett characteristics:

1. Unusual ease of adjustment
2. Natural "feel" and balance
3. Sensitive, precise action
4. Wide range of adjustment
5. Simplicity — with rugged strength

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No. 10 Band Swage Shaper

No. 36 Long Die Band Saw Swage

COVEL SAW SHARPENERS · HANCHETT KNIFE GRINDERS

FAMOUS
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GRINDING WHEELS
SEGMENTS - DRESSERS
CUTTERS - COMPOUND

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World's Largest Manufacturers of Saw Sharpening & Knife Grinding Machinery
Main Office — BIG RAPIDS, MICHIGAN
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controls used in the larger Guthrie kilns.

The entire structure is prefabricated with steel frames and aluminum panels which are heavily insulated to preserve heat. Except for a simple concrete floor, the kiln is easily portable. A track system is used for ease in loading and unloading. It is heated by either coal, oil or gas.

When Mr. Guthrie, owner and inventor, investigated the need for a small kiln in precision drying of crates needed for storage of delicate instruments at a navy depot, he became convinced that the market needed a small kiln for just such purposes. Furthermore, he noted, that lumber which had previously been kiln dried often came to the woodworker with much moisture picked up in shipment. With the new "baby" kiln, the situation can be remedied. If the woodworker wishes, he can dry green lumber to his own specifications.

In the west this kiln will be distributed by the Guthrie Dry Kiln Co., Spokane, Wash. Distribution in the east will be by Warren Brothers-Roads Co., Cambridge, Mass. Canadian distribution will be through the W. A. Long Company of Vancouver, B. C.

Do not resent growing old—many are denied that privilege.

ROPE INSERTER

The "Paxco" rope inserter is being used for assembling rope handles in ammunition boxes. This machine weighs approximately 600 pounds, is mounted on wheels for portability and is powered by a ¾ h.p. electric motor.

The rope inserter inserts rope handles in box cleats and is available either with or without automatic rope feeding and cutting attachment. A single stroke inserts the rope into the two cleats simultaneously. Capacity, we are told, is in excess of 600 rope handles

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OILSTONE GRINDERS

With one Mummert-Dixon Plurality Oilstone Grinder you get (1) Coarse Oilstone Wheel, (2) Fine Oilstone Wheel, (3) Grinding Cone, (4) Leather Stropping Wheel and (5) General Grinding Wheel. Made in 3 sizes to meet every grinding and sharpening requirement in woodworking plants. Designed for hard and long usage. Efficient. Easily accessible. Investigate Mummert-Dixon equipment now. Send for informative literature today. No obligation.

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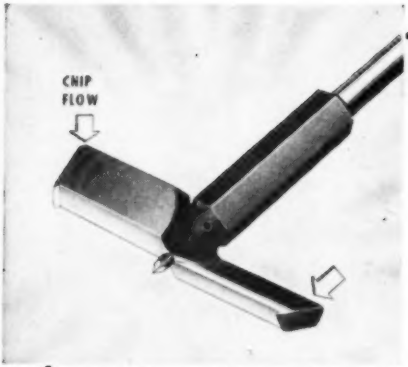

These Bits are job proved for high speed, accurate cutting. The two cutting edges are precision ground of the finest tool steel, scientifically heat treated.
They are designed in such fashion that repeated sharpening does not change the form of the bit.
Bit is removable from shank. Pilot can be adjusted or replaced.

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MACHINE BITS

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OUTSTANDING

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Smoothness, Speed, Endurance

STOCK SIZES—1" to 4½" by 16ths, 4⅝" to 6" by 8ths on special order.

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MORE SPEED **MORE SUPPORT**

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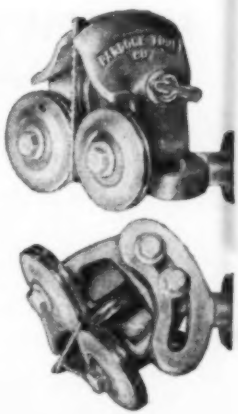
BAND-SAWS NEED "PADDOCK GUIDES"

for Faster, Better Production!

Installed on either new or old band-saws, PADDOCK BALL-BEARING GUIDES improve operation in many ways! More materials can be cut—blade-breakage is reduced—workmen are better protected—faster output results!
When a 36" machine is equipped with Model 20 guides and the guides are adjusted to hold the blade at a 45° angle (see angular adjustment at right, lower picture) material 22" wide can be cut to any length. Inter-changeable ball-bearing wheels, running with saw blade, give friction free support! Thousands are in use in every type of industry!

Write for prices and complete information. Give size of machine and material being cut.



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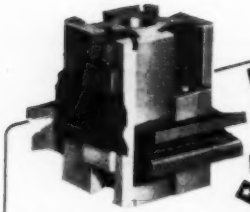

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COMBINATION HEAD

a master tool for master craftsmen—
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. . . cuts costly set-up time, boosts production! Available with milled-to-pattern bits that hold their pattern permanently for door and sash (either standard or special), as well as for matching, shiplap and mouldings of most any shape!

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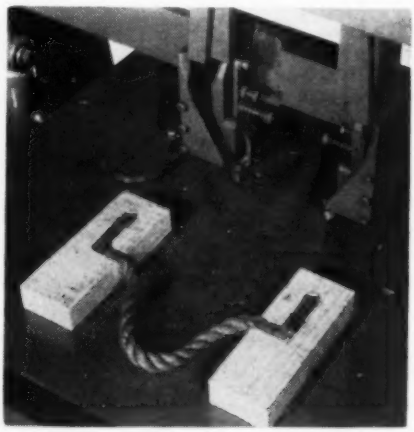
per hour. The machine is adjustable for various cleat sizes. Other box making machinery is also available



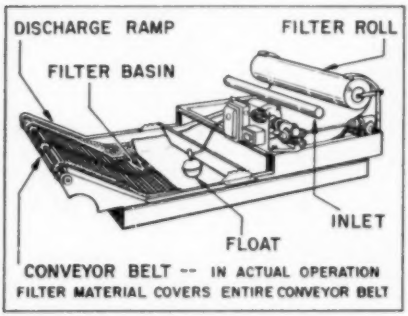
from the manufacturer, Paxton Machines Inc., P. O. Box 68, Riverside, Calif.

CUSTOM KILN DRYING

The Moore Dry Kiln Company, P. O. Box 4248, Jacksonville 1, Fla., has a list of plants set up to do custom kiln drying. At least twenty-three states are included in this listing. This is their data sheet No. D-117 and is available upon request.

AUTOMATIC FILTERS

Delpark industrial filters sold by the Industrial Filtration Co., Lebanon, Ind., are performing numerous filtering applications more efficiently through the use of an automatic process which is new in the industrial filtering field.

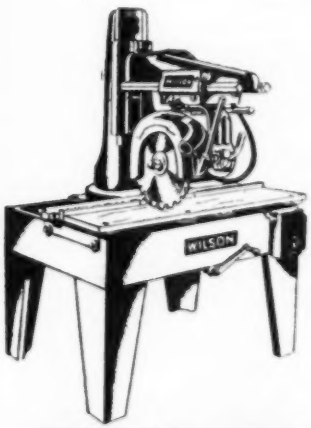


Outstanding among its many industrial uses are the filtration of paint spray-booth water, and spray curtain water used in numerous plant air-conditioning systems.

The Delpark filter is a continuous, self-cleaning gravity filter. It filters solids from liquids that will flow, by gravity, through filter material and discharges the solids, in a relatively dry state, into an outside container.

The filter material fed from a roll, rests on, and conforms to, a flat endless conveyor of open construction. Sloping sides form a shallow pool of the conveyor and an inclined discharge ramp provides for the removal of filtered solids.

In the filtration of paint spray-booth water, paint sludge can be removed from spray-booth water recirculating systems. Delpark filters remove solids from the water automatically, eliminate clean-up labor required for baffle, tank, sludge skimming and scraping, it is said. The high metallic content of some paints makes salvaging possible and the relatively dry state of the sludge makes handling simple. The sludge is deposited in an outside container to facilitate ease in handling.



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WILSON RADIAL CUTTING MACHINE

Is Insurance of ENDURANCE

A rugged, dependable, fast machine of more than a thousand uses

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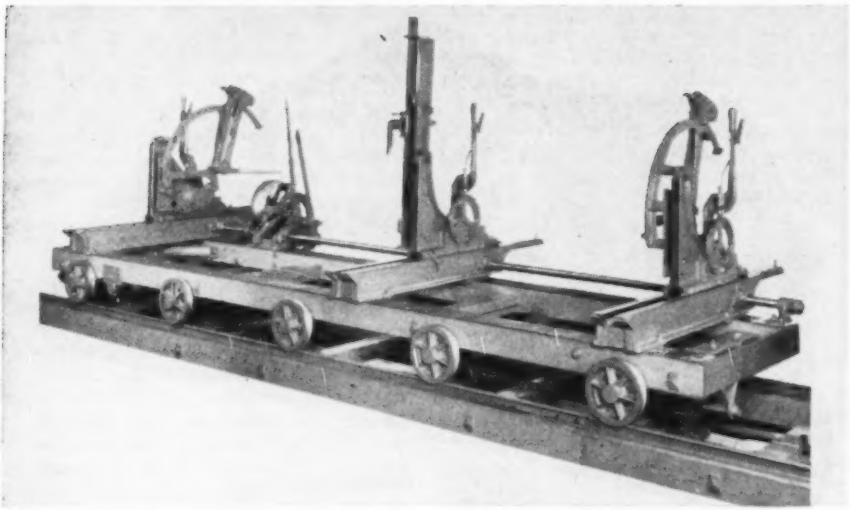

A new model 34 sawmill carriage has been manufactured by the Enterprise Co., Columbiana, Ohio, and delivered to the William Breklund Forest Products Co., Cottonwood, Idaho. According to the manufacturer this new mill contains improved features. The carriage measures 16 feet, has three 48-inch opening headblocks with independent knees on each.

No. 1 and No. 3 headblocks have hammer-type dogs; the No. 2 headblock has a Knight 3½ Ideal single dog. The rail on the saw side is V-machined, with carriage wheels machined to fit.

The manufacturer says this will improve cutting accuracy. On the other side, flat single flanged wheels are used. The longitudinal carriage timbers are faced on top with ¼ inch steel plates to make a solid and accurate setting for the headblocks. Welded steel spring cushioned end girts are used to protect the carriage and cushion the action of the cable drive. A power receder recedes or advances the headblocks under power as desired.

The book which most fascinates any executive is his volume of business.

CYCLONE Installation of twin set of Cyclone Dust Collectors on boiler house roof of modern woodworking plant.
Est. 1903

QUALITY EQUIPMENT Plus . . .

ENGINEERING ABILITY AND EXPERIENCE

When you install a Cyclone System of Dust Collection in your plant, you can be sure the equipment is designed, engineered and placed in operation . . . to meet your specific needs. Here at Cyclone we have qualified and experienced personnel to help solve your dust control problems. Contact us for engineering survey with a view to increasing your output and saving you money. No obligation.

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CHICAGO 8 ILLINOIS

CHIPBOARD FROM WOOD WASTE

Pali Panel, the chipboard with very low resin content, is soon to be manufactured in the United States. Manufacture of this board uses wood waste exclusively. Second growth timber can be used and the board can also be produced from cotton bushes.

The new board is durable and can be treated for water-proofing. Variety of applications include use in siding, furniture cores, doors, sound-proof paneling and interior panels. We are told that it can be machined with standard woodworking tools.

For information about the chipboard, or method of manufacture and machinery needed, write to Kaj Winther, Fjellman & Winther Co., 312 Henderson Ave., Joliet, Ill.

NAILER FOR DINETTE CHAIRS

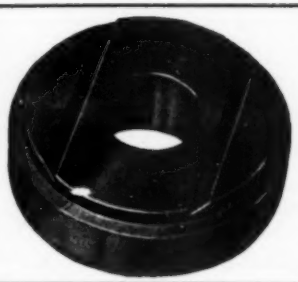
Described as "a single machine with a multiple purpose," Food Machinery and Chemical Corporation's Type 214000 industrial nailer is being used by the Daystrom - Balboa Corp., Fullerton, California, in the manufacture of dinette chairs.

Daystrom - Balboa says they have stepped up production of dinette chair back frames from 30 an hour, by hand nailed methods, to better than 150 an hour by using this industrial nailer. The machine is made by Food Machinery and Chemical Corporation, Riverside, California.

The nailer has 12 nail channels, and in the chair operation, uses full-ring type nails in two nailing sequences of five nails each, according to L. J. Kleeman, standards and methods engineer for Daystrom-Balboa. Photograph shows a chair back frame in the jig of the nailer.

HARRIS TENONER MACHINE

The Millbury Machine Co., Millbury, Mass., are offering the Harris floor model tenoner to the woodworking industry. This machine is equipped with a 3 h.p. motor, arranged with a magnetic switch box with remote control,



IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

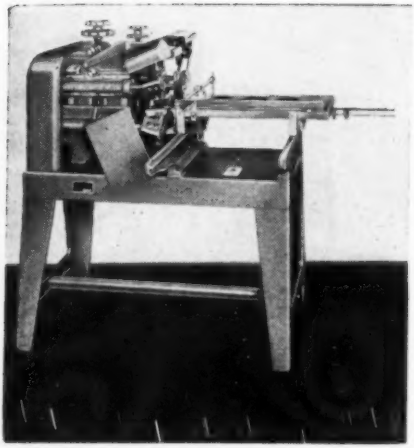
Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

GUSTAFSON & SCOTT MFG. CO.

1637 Lowell Avenue Chicago 39, Illinois



giving ample power for the machine as the cutters are so arranged that one cut is just about completed before the next cut begins. All cutter heads are equipped with standard knives and spurs.

General specifications on the machine include: tenon heads, 5" dia., 3" face; maximum tenon, 6" long, 12" wide; tenon knives, 3" wide; tenon spurs, ¾" wide; cut-off saw, 5" dia.; carriage, 16" x 26" with adjustable stops and fence; standard motor, 3 h.p., 3 phase, 60 cycle, 3600 r.p.m. Special motors can be furnished on request. The top tenon spindle has horizontal adjustment. After both spindles are vertically spaced, they may be simultaneously positioned. The cope spindles have horizontal adjustment as well as the simultaneous vertical adjustment.

NEW FILLER

V. J. Dolan & Company, Inc., 1832 N. Laramie Ave., Chicago, manufacturers of industrial finishes, announce their newest development in a wood filler, under the name of Tintone.

It is claimed that Tintone fillers produce clear, clean colors and elimi-

RUDOLF BASS

HIGH QUALITY - LOW IN PRICE

SIMONDS

New SI-CLONE SAWS

SCIENTIFICALLY HEAT TREATED • ACCURATELY GROUND
CUTS STRAIGHT • FAST • SMOOTH — STAYS SHARP

This complete new line of circular saws UP TO 12" in diameter, will give long, satisfactory service, excellent performance and the most value for the least cost. For use on all makes of table, bench, swing, radial arm and portable electric hand saw machines.

TYPE OF SAW	SIZE	PRICE
Cut-off	6"	$1.75
Rip	7"	2.00
Combination	8"	2.15
52, 54, 60	10"	3.15
Easy Cut	12"	4.35

TYPE OF SAW	SIZE	PRICE
Hollow	6"	$2.75
Ground	8"	3.95
Planer	10"	7.45
	12"	9.95

ALL SAWS SHIPPED POSTPAID EXCEPT C.O.D. ORDERS. SPECIFY BORE WHEN ORDERING, OR IF PORTABLE ELECTRIC SPECIFY MAKE AND MODEL. SEND FOR LITERATURE.

Each saw is individually packaged, in factory-perfect condition, ready for use.

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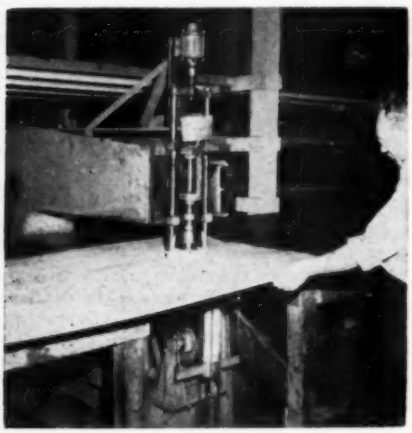
nate completely greying, spotting and hazing. They also provide greatly improved pore filling and reduced pin holing, puffing, shrinking, etc. They are available in light, medium and dark colors for either mahogany or walnut.

VENEER PATCHER

This Stolesen veneer patcher is available from the Ederer Engineering Company of Seattle, Washington. The machine is foot lever operated. It has a capacity of 30 patches per minute and a practical speed of about 10 per minute, depending upon the operator.

The operation is described as follows. The veneer sheet is placed in position; pedal depressed and the anvil lowers to hold the sheet; saw lowers to saw hole; air sucks out all refuse from the bottom; shuttle under table places plug in position and ram drives plug up into veneer. The table top is machined for a clean, flat working surface.



The patcher can be operated by a solenoid valve-actuated foot pedal. The standard plug cartridge holds 325 1/10" plugs. Two on and off switches are located directly in front of operator.

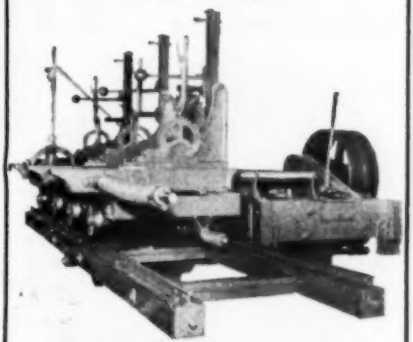
CHAIR FASTENERS

New fasteners, designed and produced by United-Carr Fastener Corp., Cambridge 42, Mass., permit knocked-down shipment of chrome furniture and thereby cut down expensive shipping space. They also reduce storage space.

The chair back fasteners hold the tubular back supports securely to the wooden core of the upholstered back. The fasteners are assembled in the chair back and the back is pushed down over the tubing. The fastener locks permanently in both the tubing and the back. The trim piece covers the rough edges of the upholstery where the tubing enters the back of the seat. The fastener snaps in and stays in. The special seat fastener screws to the seat and snaps securely into the tubular frame.

We are told that these fasteners are but three of the thousands of fasteners designed and produced by United-Carr to do a particular job for a particular manufacturer.

The Sawmill with a
FUTURE

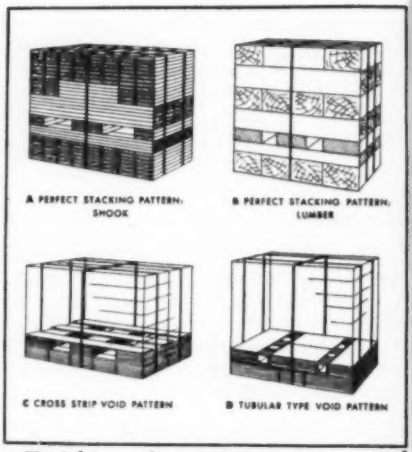


THE ENTERPRISE COMPANY
SUBSIDIARY OF WM. K. STAMETS COMPANY
MACHINERY BUILDERS & ENGINEERS
PITTSBURGH
Columbiana, Ohio, U.S.A.

STRAPPING BOX SHOOK

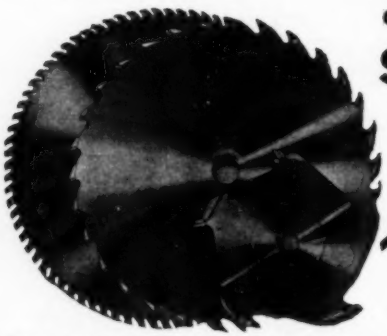
The Menominee Box and Lumber Company of Menominee, Mich., tells us they now load freight-car shipments of box shook in 4 to 5 percent of the time previously required. The creation of a method of forming and handling large unit-loads has reduced loading time to a small fraction of the 50 to 60 man-hours previously required to handle the 2500 small bundles of shook needed to fill each box car.

An average box car shipment of 30,000 board feet of lumber now contains only 75 bundles, stacked two high and two wide. This consolidation is possible because of the rigidity of the shook bundles when secured with three or more bands of ¾x.020 in. steel strapping. The lift trucks now used permit handling of unit-loads weighing in excess of 1000 lb. In addition, a fork-truck handling system, necessitated by the size and weight of strapped shook bundles, increases the usable storage space and stacking height.


A PERFECT STACKING PATTERN: SHOOK
B PERFECT STACKING PATTERN: LUMBER
C CROSS STRIP VOID PATTERN
D TUBULAR TYPE VOID PATTERN

Freight savings, storage space and stacking height can be further increased by eliminating the pallets ordinarily used when handling strapped bundles of shook, thus cutting dunnage to the bone and reducing space requirements. The

Production Z-O-O-M-S when you use VICTORY CARBIDE TIPPED SAWS



40 to 100 times greater output

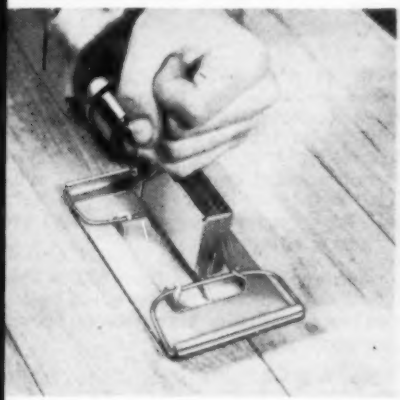
between sharpenings . . . with better finishes . . . less waste when handling costly materials. It pays-off in lower costs when you specify "VICTORY" Carbide Tipped Saws for cutting Hardwoods, Plywoods, Plastics, Laminated Materials and tough grained lumber.

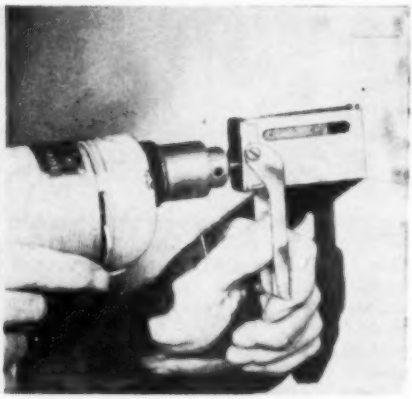
Write for Saw Bulletin and Price List

VICTORY CARBIDE SAW & TOOL CO.
3854 NORTH ASHLAND AVENUE CHICAGO 13, ILLINOIS
West Coast Representative: H. J. Komorous, 1881 Sunnyvale Ave., Walnut Creek, California
Southern Representative: Memphis Machinery & Supply Co., 205 S. Front St., Memphis 1, Tennessee

Menominee Box and Lumber Company, after considerable experimentation, designed stacking patterns for just this purpose. The variety of shook sizes required separate patterns for each type of load. The Company uses steel strapping from the Acme Steel Company of Chicago.

PORTABLE TOOL KIT





A kit containing a reciprocating sander for rough or fine finishing and a powerful portable hacksaw for wood or metal is now available from the Bertram Engineering and Supply Co., 1125 Harrison St., Kansas City, Mo. The kit also includes two saw blades, six sandpaper sheets and a polishing cloth.

The reciprocating sander has a 3" x 6" surface. The 11-ounce hacksaw fits into any ¼" electric drill. It takes a full ¾" stroke; gives full chip clearance on wood, metal or plastic stock up to ¾". Made of hardened steel, it has no gears or bearings.

RIVET ADDED BY SOUTHCO

A small size hammer-driven blind rivet has been announced by Southco Division, South Chester Corporation, 1418 South Penn Square, Philadelphia 2, Pa.

Like the $\frac{3}{16}$" and ¼" diameter versions now in production, the ⅛" drive

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VISE ACTION CLAMP
FOR
Toolmakers - Inspectors - General Machine Work
Woodworkers - Fabricators
• Fast - Positive - Lightweight • Tough Aluminum Alloy Jaws
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Grips The Work Straight - Like A Vise - Without Side Slipping
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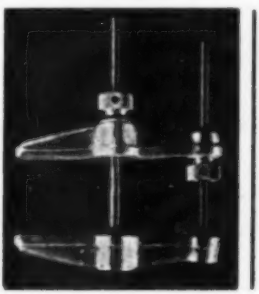
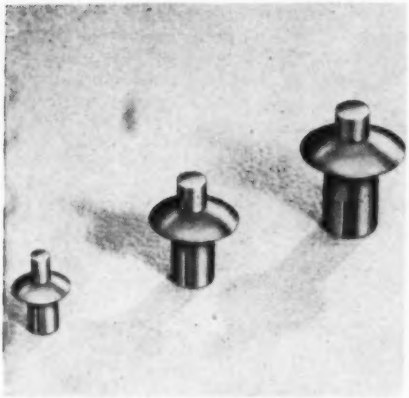




rivet is installed merely by tapping home a pin with an ordinary hammer. This one man operation requires no bucking or special tools, and is done without need for access to the rear side of the work. Driving the pin causes prongs at the end of the rivet to expand against the back sheet and form a permanent blind head that draws panels tightly together. With the pin driven flush, the outer head has a neat finished appearance—there are no stems to trim off or file, and installation requires no pulling, twisting or exploding.

Equally effective in metal-to-metal or metal-to-wood installations the ⅛" diameter drive rivet is finding immediate application in such fields as electronics manufacture, case making, attachment of name plates, and general sheet metal work. Rivets are available in modified brazier or 100° countersunk head styles, with grip lengths from 1/32" to 13/32".

REDESIGNED DRILL PRESSES

The Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J. announces a completely redesigned line of 15" drill presses. This company, one of the pioneers in the light drill press field has been making this type of machine for 20 years.

The new drill presses have a ½" capacity in cast iron and will drill to the center of a 15" circle. Spindle travel is 6" or 4¼". The 6" spindle travel model is completely new and incorporates a calibrated depth gauge and a micrometer type depth stop. All models feature a completely enclosed motor switch housing built into the head casting. Belt guards are made of light weight, strong steel stampings and are standard equipment.

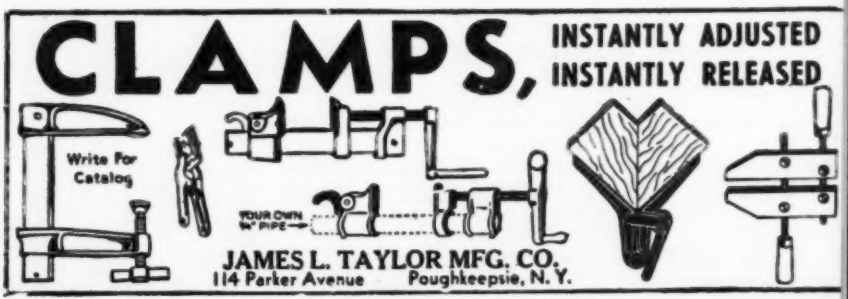
Four speeds ranging from 600 to 5000 r.p.m. are available. A slow speed pulley can be supplied where slower speeds are required.

No. 6A Jacobs Chuck 0" to ½" or No. 1 Morse Taper Spindle are optional equipment.

These new machines are available in bench, floor and multi-spindle models. Altogether there are 72 different models of this machine available.

If you will help run our government in the American way, then there will never be danger of government running America the wrong way.

- General Omar N. Bradley



buyers' service

AVAILABLE WITHOUT CHARGE TO OUR READERS

If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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222 E. WILLOW AVE. WHEATON, ILL.
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Mechanics Through the Ages

ITINERANT FRENCH IRON FOUNDERS OF THE 1780's WHO HEADQUARTERED IN PARIS, BOUGHT THEIR PIG IRON FROM PEDDLERS WHO GOT THEIR CAST IRON FROM VILLAGERS BY TRADING THEM AN EQUAL WEIGHT OF APPLES FOR THEIR SCRAP...

DECADES AFTER THE PRACTICAL DEVELOPMENT OF THE PLANER, MANY AMERICAN MACHINE SHOPS PREFERRED USING A GANG OF HAND CHIPPERS TO SMOOTH THE SURFACE OF A HEAVY PIECE OF METAL RATHER THAN GO TO THE BOTHER OF HIRING LABORERS TO HAUL THE JOB TO A DISTANT PLANER, HOIST THE WORK ONTO THE MACHINE AND BRING IT BACK TO THE SHOP..

IT WAS COMMON PRACTICE IN ENGLAND, BEFORE 1850, FOR WATCHMAKERS TO BUY UP ROUGH MOVEMENTS FROM LANCASHIRE AND FARM OUT THESE MOVEMENTS TO THREE OR FOUR CONTRACTORS FOR FINISHING. THESE CONTRACTORS, IN TURN, GAVE OUT TO A NUMBER OF SUB-CONTRACTORS, THE JOBS OF TRAIN-WHEEL PIVOTING, FUSEE CUTTING, JEWELING, GILDING AND DIAL MAKING... SOMETIMES A SCORE OR MORE INDEPENDENT WORKERS MIGHT HAVE THEIR HANDS IN THE MAKING OF A SINGLE WATCH.

They all use...

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TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS

What a combination!

***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

***Moak Speedikut Cutters*—precision ground from hardened 18-4-1 high speed steel, undercut to maintain original balance when re-ground, and true form relieved.**

Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.

***Get the facts* on Moak Shapers and Speedikut Cutters. Write for colorful illustrated booklets today.**

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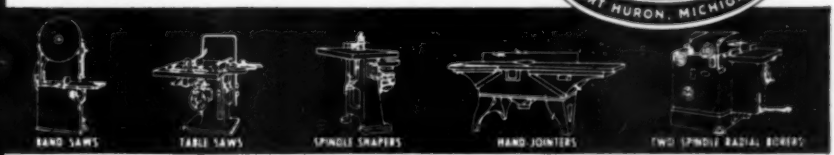
MOAK
PORT HURON, MICHIGAN



The Market Place

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

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Handy sash and door clamp—air operated, practically new
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Yates American Band Ripsaws—S. No. 281 & 282
Solem 26" Motor Driven Planer
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Planer, Fay 24 in. Pony with motor, $300
Planer, Indiana 18 in. Pony, $300
Planer, Oliver, 30x8 Cabinet rd. head, $500
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Sander, Smith 31" 3-drum Endless Bed MD, $1600
Saw, Hamilton 20 inch heavy duty, Variety, $175
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Sander, B & M 14 flat sander & motor
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1—36" Berlin 3 drum sander with motors
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Quite a number of smaller items, which we are not listing.

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15" Yates Amer. A-21 Planer & Matcher
6" Vonnegut Electric Moulder
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FREQUENCY CHANGERS
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Outputs: 90-100-120 and 180 cycle
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1—15"x4" Combination Planer Matcher and Resaw fully motorized; variable feed complete with heads. Condition excellent.

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CUDAHY, WISCONSIN

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Doig Nailer, 77", Open Back, Clincher	$4500
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HEAVY DUTY GREENLEE 24" BALL BEARING JOINTER. Practically new. Well suited to work in connection with self feeding attachment.
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Ball bearing 30" cylinder—Sectional Chipbreaker—Sectional top infeed roll. Direct motor drive

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Skinner-Uniflow Generator Set—750 KVA. With Exciter and Switch Board. Fine condition. Attractive price.

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1—BERLIN No. 180-10" with Square Heads and 25 H.P. Motor.

PLANERS

1—YATES A-62-15" All Electric, with Dble. Profiler and 10-knife Hds. for 440 volts.
1—WOODS 404B-15" with Dble. Profiler, Ball Bearings 8-Knife Cylinders and 75 HP motor for 440 volts.

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Bell No. 105 horizontal 4 spindle boring machine, serial No. 28401, motor drive, 220 V., 3 ph., 60 Cy., motor control panel No. 800, 4 boring heads, 4 spindle units and 2 extra hold downs. Can't tell from new. Less than 200 hours actual operation. Complete with dust heads and all piping. $2500.00 F.O.B. Your Plant.

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Greenlee No. 600 Sash Clamp

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STICKERS: Williamsport w plow & bore
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P. F. RIPPERS: X L, 10 hp. bb. dmd. Fay & Egan, Model 264, pb. vbd. Belsaw gang power feed ripper
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Long Lengths, mostly 10' & 12'

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We Need 5 Cars of Plywood

3/20 or 3/16 gum or poplar plywood door skins

3 ply, hot plate press or redried cold press is acceptable.

Moisture content not over 8%

No. 3 - 3 grade Sanded 2 sides

Widths - 18½ up to 37½

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30" Greenlee No. 110 dbl. planer
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Address replies to (Allied) Box 703
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District Sales Representatives, with experience selling small tools, saws or bandsaw equipment for Woodworking trade, wanted to sell line of accessories for band saw machines and saw room equipment. Products have over 20 years' selling success. Very profitable deal. Territories open: Illinois, Wisconsin, Minnesota, Iowa and Missouri: also, Michigan, Ohio, Indiana and West Virginia, New England, New York and Pennsylvania.

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SINGLE MACHINES OR COMPLETE PLANTS—No machine too small or plant too large to interest us. Will pay spot cash. Advise what you have for sale.

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House prefabricating shop foreman. Must have practical house building and shop correlating experience. Attractive position, good pay, steady employment. Mid-Ohio town. Write stating experience, qualifications, salary and when available.

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Appalachian Hardwood Lumber Producer wants manufacturer to locate in his area. Good timber reserve and good quality lumber available. Several excellent locations for lumber using industries. Write:

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For established woodworking plant in Chicago. Must be experienced and qualified to assume full responsibility for manufacture of high quality case goods and other furniture. Give full details of experience, starting salary expected, etc. Replies will be treated confidentially. This is an unusual opportunity.

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Oscoda **Michigan**

Shaper and router work for high speed production on automatic Onsrud machine.

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Dominion Bridge Co., P.O. Box 280 Montreal, Quebec, Can., tell us that they have added a new feature to their saws. The sawing movement now embodies oscillation, accomplished by incorporating eccentrics in the lower guide blocks. These eccentrics move with the connecting rods and give the saw frame its oscillating movement at the bottom. The top guides are placed on an angle so that the frame, on the down stroke, is moving ahead, and on the up stroke, backward.

The manufacturer tells us that among the advantages of this movement are reduced maintenance cost and less wear. Production is increased as well.

Loggers and woodsmen of Machias, Me., won the first sea battle with the British navy in May, 1775. They captured two scows and a British schooner using a lumber-bulwarked scow. This was sometime before the establishment of a U. S. navy was proposed.

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Greenlee 4 ft. vertical gang borer
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Yates-American Type U31 Single Spindle Vertical Borer, Direct Motor Driven

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Handy Revolving Case Clamp
Automatic Taylor Panel Flow Glue Spreader
29 Section 6½' Power Operated Billstrom Clamp Carrier
40 Section Taylor Power Operated Clamp Carrier
New Air Operated Frame and Chair Clamps

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10 Spindle Dodds Dovetailer
Dodds 12-Spindle Dovetailer
Wysong & Miles No. 290 Auto. Dovetailing Mach.
Wysong and Miles No. 500 and 600 Auto. Dovetailer

GLUE SPREADERS

Practically New Black Bros. 12" Motor Driven Edge Glue Spreader
New Union Conveyorized Edge Glue Spreader
Taylor Panel Flow Edge Glue Spreader
62" Black Dble. Rubber Roll Resin Glue Sprdr.
54" Union Dble. Rubber Roll Resin Glue Spreader

JOINTERS

Yates-American No. 215 Direct Motor Driven Glue Jointer
Yates-American 16" No. 1 Direct Motor Driven Ball Bearing Hand Jointer
Porter 6" Direct Motor Driven Ball Bearing Hand Jointer

LATHES

Mattison 42" No. 57-D motor drive ball bearing
Mattison 30" No. 55-C motor drive ball bearing
Yates-American 30" T-5 Lathe

MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
Greenlee No. 227 direct motor driven single spindle mortiser

MOULDERS

Vonnegut 4" electric Moulder
Yates-American 4" Type C-83 Electric Moulder
Woods 6" No. 132M Electric Moulder
Newman 6" No. 46 Electric Moulder
Newman 12" No. 27 Ball Bear. Belt Dr. Moulder
Practically new 12" Vonnegut Electric Moulder
Hermance 8" No. 50 Ball Bearing Moulder
Hayes Sash & Door Sticker w/Plowing & Boring

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Buss 30" Direct Motor Dr. Ball Bear. Sgl. Planer
Buss 36" Direct Motor Dr. Ball Bear. Sgl. Planer
New Crescent P-24 Direct Motor Dr. with Grinder
Greenlee 36" No. 110
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Herzog Feed

DOUBLE PLANERS

Yates-American 30" No. 177 Ball Bearing Direct Motor Driven with electric Knife Grinder

SANDERS

Yates-American 43" No. 431 Direct Motor Driven Endless Bed Sander
Mattison No. 124 Automatic Stroke Sander
Wysong & Miles 8' No. 294 Automatic Stroke Sander Direct Motor Driven Ball Bearing
Pearson Waterfall Sander
Oakley Semi-Automatic Stroke Sander
Oakley Model H drawer Sander
Nash No. 50 and No. 25 Turning Sander
Wysong & Miles No. 604 and No. 315 Edge Belt Sander, practically new

BAND SAWS

American No. 4 Band Resaw
J. A. Fay & Co. 36" Band Saw

CUT-OFF SAWS

Wilkin-Challoner Chain Feed Double Cut-Off Saw and Panel Sizer
Yates-American No. 51 Direct Motor Driven Swing Saw
2 Beach Direct Motor Driven Ball Bear. Double Cut-Off Saws & Rip Saws for Sizing lge. Panels

RIP SAWS

New Marion Glue Joint Rip Saw
Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw

VARIETY SAWS

Bell No. 12 Direct Motor Driven Ball Bearing Double Miter Saw
Yates-American No. 1 Direct Motor Driven Ball Bearing Variety Saw
Buss Direct Motor Driven Ball Bearing Variety Saw

SHAPERS

Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 393 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W125 Single Spindle Automatic Shaper

TENONERS

Fay & Egan No. 505 Direct Motor Driven Ball Bearing Single End

VENEER MACHINERY

Francis 76" Hydraulic Veneer Clipper
Dennis Veneer Taping Machine, Motor Driven
100" Merritt Veneer Clipper
Merritt 8 and 10 plate redriers 84" by 54"
Francis Hydraulic Veneer Press 84" by 36", Large quantity irons and clamps, cauls, head blocks, and overhead crane.
Merritt 13 Plate redrier 60 by 36

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Defiance Electric Router
New Raimann Automatic Knot hole borer & plugger
7½ KW Motor Driven Frequency Changer

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Hand Jointers 6" to 24" **Mitre Saws** **Self-Feed Rip Saw**
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West Side 36-in. V-belt, M.D.
American 42" V-belt, motor drive
Tannewitz 42" M.D.
Buss 36 in. bab.-brg., V-belt, motor-drive

BAND RIP AND RESAWS
Yates No. 312 44" chain-feed hand rip
McDonough 62" Vertical Band Resaw
Mershon 42" Twin Band Rip, B.B.

BORING MACHINES
New Wysong and Miles sgl-spdl. Vert., d-m-d.
Greenlee 363-6 spindle, Univ. Vertical, M.D.
Root "B-M" 16-spindle, cluster hd. motor dr.
Greenlee 356-P Single Ver. power feed
Andrew single-spindle vertical, motor-drive

BLOWERS AND FANS
American No. 80E with 40 h.p. coupled motor
Clarage type IE Model II, Ball Bearing.

CLAMPS—GLUE ROOM EQUIPMENT
Greenlee No. 599 frame and furniture clamp
Black Bros. 30-section, 10-ft., power-feed, ten Style E clamps per section, jaws 7-in. high, opening 24-in.
Taylor 6-ft. 12-sec. wheel type clamp carrier

FILING ROOM MACHINERY
Rogers 38" cup wheel auto knife grinder
Hanchett No. 608 lap gr. b.b. max. cap. 8" wide
Covel-Hanchett No. 325 thin knife grinder
Black Diamond No. 5 circular saw filer, m-d.

JOINTERS
8" American "Clement" long tables
Yates No. 213 Continuous feed direct M.D.
American No. 1, 24-in. ball-brg., motor-drive
Porter, American, Oliver, Sidney, Fay & Egan, from 8" to 30" wide—several have feeding attachments-tell us what you need.
Yates No. 199, 20-in. rd-hd., V-belt, m-d.

LATHES
Whitney 50-in. backnife, gage, lathe
Yates-American T5 Auto. Shaping, M.D.
Mattison No. 214 copying lathe
Oliver 12"x6' bed speed lathe, d-c mtr. in head
Blount 6-in. 6-ft. speed lathe

MORTISERS
Greenlee No. 228 vertical automatic H.S., m-d.
New Britain No. 2 Chain, With motor
Northfield hydraulic chain, motor-dr.
Greenlee No. 227 hollow-chisel, belt drive
F. & E. No. 144 horizontal, power-feed

MOULDERS
Yates No. C3 4" fast feed, belt drive
Yates No. 108 10" belt drive coupled motor
Newman 4"x4" all Electric
Woods 132M 6" Electric
Smith 6-in. belt drive with motor
Vonnegut 8-in. electric moulder and frequency changer
Yates C-88, 8-in. x 4-in. all electric

NAILING MACHINES
Auto Nailer "Blue Model" M.D.

PLANERS
Buss 4-L, 30-in. round-head, motor-dr.
Yates Amer. J 18, 18" single B.B. D.M.D.
Yates No. 156 20" dr. hd. m.d.
F & E No. 156 24-in. single, dir. m.d.
Buss 6A 36" 6-roll single dir. m.d.
Berlin No. 177, 30x12" double belt dr.
American No. 80, 15-in. double, heavy duty
Yates B-2 36-in. double, motor-drive

ROUTERS
Carter Type TR, motor-drive 15,000 r.p.m.
Ekstrom-Carlson No. 126, ball brg., motor-drive

SHAPERS
Porter No. 103 single, ball-bearing, motor-drive
Whitney No. 134 double-spindle dir. M.D.
Amer. No. 20 dbl-spdl. dir. M.D. Freq. Chgr.
Whitney No. 165 S.S., motor on arbor
Onsrud W-248 single, ball bearing
Whitney No 282 Sgl. D.M.D. 56"x40" table
Onsrud W125 Automatic 84" cap.

SANDERS
Yates No. 430 hand block belt, motor-dr.
Yates No. 421, 49-in., 6-drum with motors
Yates 401-49" roll feed, M.D.
Salem No. 370 43" 2 drum End. Bed
Fay & Egan 30" 3-drum roll-feed
Mattison No. 124, 6-ft. auto. stroke, m.d.
Buss 2-spindle vertical, oscillating belt drive
Wysong & Miles No. 164 universal belt, m.d.
Yates No. 431, 43-in., 3-drum end-bed, m-d.
Porter-Cable 15 in. disc, motor drive

MITRE SAWS
Delta 10-in. tilt-arbor with motor
American 12-in. tilting-arbor, motor-drive
Wallace 8" tilt-arbor, 1 h.p. 1-ph. motor
American Dbl. revolving Arbor 5 HP Belted mtr.
Whitney No. 77 tilting arbor, direct m.d.
Dodds tilting-table, V-belt, motor-drive

CUT OFF SAWS
De Walt Radial Arm, 5 HP motor
Jenkins No. 97, 103x48" double-end, chain-feed with copes, direct motor-drive
Greenlee No. 451 auto., cut-off and dado
Buss double cabinet type, motor drive
Porter 43-20S 36-in. stroke, motor on arbor
Fay & Egan No. 307 butting saw
American 12-in. tilting-arbor, motor-drive

RIP SAWS
Yates G-2 Chain feed, B-B. mtr. dr.

TENONERS
Fay & Egan 505 electric with copes
Greenlee No. 534, tilting spindles, dir. m-d.
American single-end with copes, rolling table
Jenkins No. 95 double end, jump dado, d.m.d.

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perior 3-Spindle, Adjust. Horiz. Motor Driven

AMPS—ASSEMBLY
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l 4-way Frame & Chair Back, Air Operated.
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ndy Revolving Case, 48" Opening
ndy Revolving Case, 60" Opening
ndy No. 5I Cabinet Clamp, Air Operated

AMP CARRIERS
ylor 30-section, 6½" wide, 4-38" clamps per sec.

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wker No. 2, capacity ¼" to 2", B.B., M.D.

CERS—JOINTER FEEDERS
erican 24" Ballbearing, Round Head, Motor Driven, with Billstrom Feeder

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hl No. 60, Continuous Chain Feed, B.B., DMD
& A 6" Round Head, B.B. Motor Driven
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erican 12", Round Head, Motor Driven

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ORTISERS
enlee No. 228 Vert., Hollow Chisel, M.D.

OULDERS
erican No. 1, 4", 4-Side, Motor Driven
erican No. 1, 6", 4-Side, Motor Driven
glesfield 4", 4-side all electric, B.B.
ttison No. 262, 6", 4-Side All Electric B.B.

OUTERS
ter No. 502, 2-spdl., B.B., D.M.D.

ANERS
rks 12" Single, Ball-bearing, Motor Driven
s No. 4, 30" Single Cabinet, D.M.D., B.B.
perior 28" Single, Motor Driven
tes No. 156, 26" Single Cabinet, Motor Driven
perior 24" Single, Motor Driven

WRITE TODAY

Whitney No. 32, 30" sgl. Cabinet, D.M.D., B.B.
American No. 566, 30" Dbl. Cab., D.M.D., B.B.

SANDERS
Smith 43", 3-drum Endless Bed D.M.D.
American 42", 3-drum, Roll Feed, M.D.
American 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Mattison No. 138 Hand Block Belt, Motor Driven
Mattison No. 172, Oscillating Edge Belt, M.D.
Pryibil 20" Horizontal Belt, Motor Driven
Porter-Cable 10" Vertical Belt, D.M.D., B.B.
Delta 6" Adjustable Belt, B.B., M.D.
Nash No. 10, 48", 6 Spindle, Auto. Turning Sander, Motor Driven
Ekstrom-Carlson No. 23 Scroll, Ball-bear., D.M.D.
Pearson Edge Moulding, Ball-Bearing, D.M.D.

SAWS—CUT-OFF
DeWalt GP Radial Type, Ball-bearing, D.M.D.
Diehl No. 725 Hydraulic, Automatic Cut-off Saw, Direct Motor Driven, Ballbearing
Bell No. 12-B Dbl. Mitre and Cut-Off, BB, DMD
Buss Double End, Motor Driven
Racine Floor Type—Motor Driven
Fay & Egan Double End, Motor Driven
Oliver No. 136 Ceiling Type Swing, Ballbearing, Direct Motor Driven with Tables

SAWS—RIP
American No. 15 Chain Feed, Motor Driven
Mattison No. 207M Chain Feed, DMD, B.B.
Eaglesfield Chain Feed, D.M.D., B.B.
Yates G-2, Chain Feed, Ballbearing, D.M.D.

SAWS—VARIETY
American No. 1, Tilting Table, Motor Driven
Dodds Tilting Table, Motor Driven
Pettingell, Tilt Arbor Roller Table, M.D.
Yates-American Tilting Arbor, B.B., D.M.D.
Delta Uni-saw Tilting Arbor, B.B., D.M.D.

SHAPERS
Whitney No. 393 Automatic, Single Spindle, BB, DMD, with Frequency Changer
Onsrud W125 72" Automatic, multiple stations, B.B., Direct Motor Driven, with freq. changer
Buss, Sgl. Spdl., Hi-Speed D.M.D., B.B.
Oliver Sgl. Spdl., Hi-Speed D.M.D. B.B.

SPREADERS—GLUE
Francis Model G, 45" Double Roll, for cold glues, Motor Driven
Advance 24", Double Roll, equipped for steam
Bell No. 13, Auto. Dovetailer Gluer, electric heat

TENONERS
McKnight No. 71C Chair Back Tenoner, M.D.
Towsley Single End, Tenon heads, lower cope, cut off saw, Motor Driven

VENEER MACHINERY
Dennis Continuous Feed Veneer Jointer, M.D.
Dennis Veneer Taping Machine, Motor Driven
Jenkins-Falls Veneer Jointer, B.B., Motor Driven
Merritt 84"x54", 3 Plate Veneer Redrier, D.M.D.

MISCELLANEOUS
Mattison No. 231 Univ. Cutterhead Gr., D.M.D.
Auto-nailer, Floor Type, Direct Mtr. Driven, B.B.
Yates-American T-5, 30" Auto. Turning Lathe, Direct Motor Driven, Ballbearing
Invincible 30" Exhaust Fan, Motor Driven

FADER WOODWORKING EQUIPMENT QUALITY

A. L. FADER & COMPANY

223 N. DESPLAINES ST. • CHICAGO 6, ILL.

BORING MACHINES

Andrews 6 spindles 8' Horiz. foot feed
Bell BBMD No. 24 Dcuble end, boring & chucking and sawing 54" capacity Model 24A
Jones Superior radial 1" to 16"
Prybill—radial 1" to 12"
Single spindle horizontal

DOVETAILERS

Dodds 10, 15, 20 spindle

DOWEL MACHINES

Hawker No. 2 All Ball bearing & roller bearing VBD
Hawker No. 2 Ball Bearing Head VBD

JOINTERS

American 12" Wedge Bed BB
Amercian 16" Wedge Bed BB
12" Colloday L. Powers, H. B. Smith, Crescent Sidney
Northfield 12" DMD Heavy Duty

LATHES

Mattison 55C BB Live Tailstock

MORTISERS

Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Mattison No. 262 6" Drop Bed DMD
Eaglesfield 6" DMD BB All Electric
Yates C55 9" DMD All Electric
Yates American C55 9" DMD All Electric
S.A. Woods No. 107 12" 5 hds., belt driven
S.A. Woods 701 all electric DMD 12"x4"
S.A. Woods N. 131 9", belt driven
American C4A 8"x4" B.D.

PLANERS

American Saw Mill Pony 24" 5 HP CMD
Buss 30"x8 No. 4ML DMD Motor, sectional feed roll, sectional chip breaker Knife Grinder
Buss No. 4 BB 30" single Sec. Feed & Chip CMD Knife Grinder
Northfield 24" sinale, MD motor fd. No. 5
Whitney No. 32 36" BB CMD Knife Grinder

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

SANDERS

Peerless 9", 14" and 20" horizontal
Peerless 9", 14" Vertical
Wysong & Miles, Oakley, Mattison belt
H. B. Smith 42" 3 drum, endless bed
Yates 42" 3 drum Belt drive

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BD
DeWalt BB DMD 10 HP with water pump and 2 vises Metal Cutting Model ME-2
Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB

SAWS - BANDSAWS

American BB No. 4 40" rip and resaw
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
32" Crescent guarded BB VBD
Northfield BB & DMD 20" to 36"
Oliver 30" DMD Fully Guarded

SAWS - RIP SAWS

Diehl BB No. 77 DMD 15 HP
Sinker Davis, self feed gang, BB belt dr.
Hermance Straight Line Plain Bear., BD

SAWS - VARIETY

American Saw Mill 5 HP DMD Tilt Arbor
American No. 10 tilt top belt drive
BM Root tilt top belt drive
Northfield Tilt Top DMD
Towsley DMD Tilt Arbor 5 HP
Fay & Egan DMD Tilt Arbor 5 HP
American Sawmill Tilt Arbor DMD 5 HP
50 other makes to choose from

ROUTERS

Ekstrom Carlson New No. 232
Ekstrom Carlson No. 126

SHAPERS

McCartney BB 1 spindle
L. Powers single BB - MD
Union Single spindle BB MMBD
Onsrud No. 200 Single 15,000 RPM
Whitney 2 sp. automatic BB MD No. 102
Whitney sinale 153 DMD and Belt Drive
Yates N2 BB MD
Yates N1 Double Spindle BB BD-2-7½ HP

TENONERS

Crescent single end, 5 head individual motor drive, BB
American No. 1 Single end belt driven
Newman single end BD
Greenlee Single 531 BB 5 heads

MISCELLANEOUS

Electric Carpenter 5 machine combination all ball bearing motor driven.
NEW—Taylor caterpillar clamp carrier 60 sections, 6½' centers, 32" wide clamps, air rotation.
Jenkins Veneer Jointer
Evans Ring Joint Machine
Union case clamp.
Covel Hanchett Band Re-saw grinder MD
Morgan Double Lock Corner No. 6, 12"x27"
Fay & Egan No. 470 Jigsaw
Smith & Phillips pulley pocket machine

Endless canvas belts, large variety of lengths and widths, also sand belts for Skilsaw, Porter Cable and Vonnegut brush sanders. Accessories and supplies, tremendous lot both new and used. Also band and resaw blades.

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BAND SAWS:
American 20"
Crescent 20" Ball Br. New
Northfield, 20" M.D. new
Lehman 30" Bab. Br. $125.00
Crescent 36" belt or motor
Fay & Egan No. 345 36"
Tannewitz 36" 7½ h.p. Motor D.M.D.

BAND RESAWS:
Chicago 40" Vertical $1250.00
Connell & Dengler 60" Vertical, $1566.38
Yates V-4 54" Vert. Bab. B. M.D. takes 7" wide blades. Filing Room Equip. if wanted.

BORING MACHINES: Fay & Egan No. 190 Single Spl. Vert.
Andrews 32" vert. multiple
Andrews 32" Double Col.
Andrews Vertical 80" Ball Br. M.D. 8 or more spdls.
Fay & Egan Vert. Multiple Spindle M.D.
Root Single Spl. Motor on Spl.
Root 2 spl. Hor. late type
Dennis Sgl. Vert. Universal
Greenlee Post Borer
Moak 2 spindle Horizontal Radial Dowel

BOX MAKERS MACHINERY:
Hall & Brown Box Board Matcher
Tide Box Makers Rip Saw M.D.

CLAMPING MACHINERY: American fig. 8853 8 ft.
Rowley & Hermance Door Clamp 3½ x 8 ft.
Lancaster Pneumatic Chair Clamp
Black Bros. Chain Clamps
3000 Spring Clamps No. 2 and No. 3
Greenlee No. 602 Q. A. Sash Clamp
Handy No. 100 End Clamp 78" cap.

DADO SAWS: Fay & Egan No. 5 C.O. and Dado
American No. 1 Dado Saw Auto.
Hall & Brown No. 134 Comb. C.O. Dado Saw Pwr. Fd.

CUT OFF SAWS:
Greenlee No. 453 Auto. Railway C.O. 7" cap.
Comet Timber C.O. 10 h.p. 44" blade
Swing Cut Off Saws (several)
Fay & Egan Table C.O. Saw

DOWEL MACHINE: Fay & Egan No. 406 Rod Mach.

JIG SAWS: Oliver No. 173-B Ball Br. Self Contained Motor built in. New at Bargain Price
Beach No. 1 Tilting Table Scroll Saw
Jones Superior M.D. Self Contained

JOINTERS: Crescent 12" B.B. 4 Knife
16" Fay & Egan No. 316 B.B. M.D.
Smith 16" 4 knife Jointer
Fay & Egan 20" rd. hd. Jointer
Fay & Egan No. 316 20" Rd. Hd. M.D.
Northfield (Late) 12" B.B. Motor on Hd.
Fay & Egan 24" No. 115 Belt or Motor Dr.
Moak 12" B.B. Jointer M.D., New

LATHES: Oliver 12"x5 ft. Sgl. Ph. Motor Headstock
Goodspeed type AV-4 Automatic
Wood Lathe Sets 12" to 24" swing
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New Britain No. 4 Chain with H. C. Attach.
New Britain No. 7 Chain, Compound Table M.D.
Wysong & Miles No. 134 H. C. Auto. Feed
American No 20 H. C. Comp. Table M.D.
American H C. Horizontal Auto. Feed
Crescent Hollow Chisel Mortiser

MOULDERS:
American No. 3 Heavy 6" 4 side
Fay & Egan No. 22 12" 4 s. Moulder $800.
Fay & Egan No. 207 7" 4 side
Hermance No. 50 8" 4 side Bab.
Hermance 10" 4 side
Hermance 6" 4 s. 10 hp.
Fay & Egan No. 184 12" 4 side
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NAILING MACHINES:
Grammes 4 track Cigar Box Nailer
Doig 2 track Cigar Box Nailer
Doig 3 track Close Back Nailer
Doig 11 track closed back
Doig 18 track Nailer-Cleater

PLANERS—DOUBLE:
Berlin 30"x12" $750.00
American 26"x8" Double
Whitney No. 24 30"x7" Dbl. Planer, B.B., M.D.

PLANERS—SINGLE:
Crescent No. 224 24"x6" Feed M.D.
Fay & Egan No. 2 24"x6"
American No. 1 20"x6"
Powermatic 12"x4" M.D.
Sidney 18"x8"
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PLANER & MATCHER:
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NEW MULTIPLEX RADIAL SAWS IN STOCK:
Comet 3 hp., 1 ph. New
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No. 30-A¾ hp. single ph.
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RIP SAWS:
Falls No. 103 St. Line B. B. 15 hp. motor
Falls No. 103 St. Line B. B. Belt Dr.
Mereen Johnson No. 441 Gang
Greenlee No. 429 Power Feed
Fay & Egan Heavy Hand Feed 10" cap.

ROUTERS: Kelley Elect. Stair Router 3 ph.
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Hunter Elec. Stair Router $75.00
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Portable 1 hp. and 2 hp. New

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Yates-American No. 0 Variety Motor Arbor
Crescent No. 2, 3, and 5 Universal

SANDERS:
American-Col. 42" 3 drive
American No. 15 24" single dr. Hand Feed
American No. 15 30" single dr. Hand Feed
Mattison No. 115 Variety Belt Sander
Porter Cable Oval. Spindle, M.D.
Porter 15" Disc M.D.
Wysong & Miles No. 171 Belt Sander
Yates American Comb. 15" disc & Drum M.D
Yates No. 401 42" 3 Dr. Roll Feed

SHAPERS:
American No. 1 Sgl. Ball Br. M.D.
Delta Floor type M.D.
Crescent Single Ball Bearing M. D.
Crescent S-2 B.B. M.D.
Fay & Egan No. 265 Dbl.
Fay & Egan No. 552 Single Ball Bearing M.D.
Double Spdl., B.B. Mtrs. on spdl., 3000 or 7200 rpm
Porter No. 105 B.B. M.D. (late)

TENONERS:
American No. 1 Copes and C. O. Saw
Crescent T-3 Electric Tenoner
Fay & Egan No. 2 2 copes
Powermatic B. B. Tenoner
Smith Sgl. Heavy Copes & C. O. Saw

TIMBER PLANER:
Yates P-12 12"x20" 4 side

VENEER CLAMPS: 5—38" 3 screws
4—29" 2 screws

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F & E No. 312—2' Vertical, M.D.
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Doig 9-Track Nailer, C.B., M.D.
Morgan 16-Track Nailer, O.B., with clincher
Saranac Single Head Stapler, M.D.
C & D 24" Two-color Printer, M.D.
Detroit Model B Power Screw Driver
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Handy Case Clamps, 48" Cap.
Handy No. 160 Frame Clamp
Handy Dual End Clamp, 36" Cap.
Taylor 40 Section 7' Capacity Clamp Carrier
JOINTERS
Union 6", B.B., D.M.D.
Sidney 16", B.B., D.M.D.
American 20", B.B., M.D.
Jenkins No. 343A Glue Jointer, B.B., D.M.D.
Porter 24" B.B. Facer with Herzog Four-Post Feeder, M.D.
MORTISERS
Loeffler No. 609, Motor Driven
Sidney Hollow Chisel, B.B., D.M.D.
Greenlee No. 228 Hollow Chisel, M.D.
MOULDER
Woods No. 144M, 6", 2 hd., all elec. B.B., D.M.D.
Hopper Feed for Mattison No. 229 Moulder
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Yates No. 156-30" Single Cabinet, B.B., D.M.D.
Smith 30" Single, Cabinet, B.B., D.M.D.
Buss No. 4A, 36" Single Cabinet, B.B., D.M.D.
Whitney 36" Single Cabinet, B.B., D.M.D.
ROUTERS
Ekstrom-Carlson No. 223, B.B., M.D.
Ekstrom-Carlson No. 327, B.B., M.D.
Onsrud No. 240-D, B.B., M.D.
SANDERS
Solem S3M 42" 3-drum End, Bed, B.B. D.M.D.
Smith No. 404 42" 3-drum End, Bed, B.B., D.M.D.
Berlin 60" 3-drum Roll Feed, Spiral Drum, M.D.
American No. 9 3-drum, 61" Roll Feed, D.M.D.
Mattison No. 124, 6' Auto. Stroke, M.D.
Mattison No. 138 Hand Block, M.D.
Jones Superior — 48" Double Disc, M.D.
SAWS
American No. 110 54" Band Resaw, B.B., M.D.
Porter C-43 Cut-Off Saw, B.B., D.M.D.
Mattison No. 244 Cut-off Saw, B.B., D.M.D.
Mattison No. 207 chain fd. Rip Saw, b.b., d.m.d.
Bell No. 12 Double Mitre Saw, B.B., M.D.
Buss Double Cut-off Saw, M.D.
Bell No. 16 Sw. Cut-off saw B.B., M.D. (New)
SHAPERS
Crescent No. S-2 Single Spindle, B.B., mtrzd.
Sidney 2-spindle B.B., motorized
Onsrud W-226 Buck Shaper, B.B., D.M.D.
TENONER
Jenkins No. 95, 48"x90" Double End with upper scoring saws, B.B., D.M.D.
MISCELLANEOUS
Frisch, 38"x60" High Freq. Edge Gluer with pump, 8 KW heating unit
Jenkins No. 126 Combination Boring Gluing & Dowel Driving Machine, M.D.
Merritt 36"x72" 6-plate Redrier
P & B Ring Machine, B.B., M.D.

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Sta-Warm Electric Heated Gluemixers and Glue Pots
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Hydraulic Press, 52" x 44" Platen with Motor and Pump
Fifield 12" Round Block Clicker Press and Bench Slitter
Jacques 48"—50" and 60" Hand Paper Cutters
Western Perforator And Cut-Out Machines
Green Pneumatic Steam Heated Cornerangle Forming Press
Fay & Egan No. 225-48—3 drum roll feed sander with motors
American No. 1 and No. 2½ Single End Tenoners
Hall & Brown No. 208 Hollow Chisel Mortiser, M. D. 36" and 20" Band Saws
Powermatic 12" and 16" Planers
Famous 16" Jointer B. B. Coupled M. D.
Beach Carriage Cut-Off Saws 6 and 8' carriage
Yates C3-4"—4 side Moulder
Hall & Brown No. 209-15 x 6" Planer and Matcher with double Profiler
1—Nash motor driven 24"

Large Number of Small Portable Tools and Miscellaneous Items.

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BORERS—Horizontal & Vertical
Towsley two-spindle horiz. radial borer.
Oliver No. 71—3-spindle horizontal borer.
Greenlee No. 368-30" Mult. Horiz. Borer
Andrew 48" & 72" Mult. Horiz. Borer
Wysong & Miles No. 283-B Vert. Sgl. Spl. Borer.
Greenlee No. 386 8-ft. vert. multiple borer
Greenlee No. 369—48" Vert. Mult. Borer.
Andrews 60" multiple vertical borer.

CHAIR MACHINERY
McKnight double end sawing and boring machine.
McKnight 4CM horiz. and vert. borer with double end sawing
Pringle & Brodie horizontal borer.
McKnight No. 1E saddle seat machine.
Bell No. 8 dowel gluer and driver
Dauber-Bell dowel cutter and pointer.

CLAMPING MACHINERY
Taylor-Billstrom-Black 12-18-30-40 section clamp carriers.
Handy No. 447 Air Operated, 2-Way End Clamp.
Handy and Union revolving case clamps.

GLUE MIXERS & SPREADERS
Francis M-7 (75 gallons) Veg. Glue Mixer.
Union 36" and 60" Dbl. Roll Resin Glue Spreaders
Francis 12-in. edge glue spreader.

JOINTERS
Fay & Egan No. 506—12" hand jointer.
Yates-American No. 213 Glue Jointer.
Jenkins No. 343-A glue jointer
Diehl No. 60 glue jointer.

LATHES
Mattison No. 55-C Auto. Turning Lathe, B.B.
Mattison No. 210 copying lathe.

MORTISERS
Greenlee No. 227 automatic hollow chisel mortiser.
Greenlee No. 228 Auto. Hollow Chisel Mortiser.
New Britain No's. 2 and 7 chain saw mortiser.
Whitney No. 67 horiz. osc. bit mortiser.

MOULDERS
Mattison No. 276—6-in. electric moulder.
Vonnegut 6-in. electric moulder.
Yates No. 108—10-in. heavy-duty moulder.
Yates C3A-4" BB Belt Drive Moulder.

PLANERS—Facing
Whitney No. 33—30" single planer.
Porter 24" facing planer—Herzog feed
Yates-American No. 3—30" facing planer. Herzog feed

PLANERS
Buss 4-A 30-in. single planer
Whitney No. 29—36-in. single planer.
Greenlee No. 110—30" 6-roll single planer.
Whitney No. 24—30" and 36" Double Planer.
Whitney No. 33—40" Heavy Duty Dbl. Planer
Yates-American No. 177—30" roughing planer.

ROUTERS
Onsrud W-240 heavy duty electric router.
Porter No. 600 and 610 heavy duty elec router

DRUM SANDERS
Yates No. 413 31-in. 2-drum endless bed sander
Yates No. 431—43" 3-Dr. End. Bed Mtrzd.
Solem S-3-M 73" 3-Drum Endless Bed Sander
American No. 9—61" 3-drum roll feed sander, mtrzd.

SANDERS—Belt & Miscellaneous
Curtis No. 8 semi-automatic stroke sander
Mattison No. 124 Auto. Stroke Sander.
Wysong & Miles No. 277 hand block belt sander.
Nash No. 10 & No. 25 Auto. Spindle Sanders.
American No. 11 horiz. surface sander.

SAWS—Band Scroll & Resaws
Tannewitz Type G, 36-in. band scroll saw.
Superior 36-in. band saw—Carter wheels.
Fay & Egan No. 50—36" band saw.
McDonough 44" vertical band resaw.

SAWS—Cut-Off
Porter 43-208 straight line cut-off saw.
Yates-American G-44 straight line cut-off saw.
Jenkins No. 105-A Dbl. Cut-Off and Mitre Saws.

SAWS—Rip
Diehl No. 75 straight line ripsaw.
Mattison 206-207 and late model 202 straight line ripsaws.
Yates-American G-77 straight line ripsaw.
Greenlee No. 426 self-feed ripsaw.

SASH & DOOR MACHINES
Bell No. 5-B stile and rail borer.
Bell No. 11 power door clamp.
Bell No. 7 dowel driver and gluer.
Milbury pocket cutter.

VARIETY SAWS
Tannewitz Type J tilting arbor variety saw.
Whitney No. 61 tilting arbor variety saw.
Fay & Egan No. 500 tilt-table variety saw.
Tannewitz tilt-table variety saw, b.b.
Baker Double Arbor Variety Saw, BB.
Yates-American No. 8 saw and dado machine.

SHAPERS
NEW Crescent No. S-2 Single Spindle Shaper.
Porter No. 103 Single Spindle Shaper
Porter No. 201 Double Spindle Shaper
Greenlee No. 180 Double Spindle Shaper.
Whitney No. 351 double spindle, 12½ HP motors
Whitney No. 393 Automatic Single Spindle Shaper.
Onsrud No. 124 automatic single spindle shaper.
Whitney No. 202 automatic double spindle shaper.

TENONERS
Greenlee No. 532 single end tenoner.
Greenlee No. 530 single end tenoner b.b.
Wilkin-Challoner No. 70 - 96" double end tenoner.
Jenkins No. 95—96-in. double end tenoner.
Jenkins No. 96 60-in. double end tenoner, b-b.

VENEER EQUIPMENT
Dennis No. 2 veneer taper.
Francis 30"x72" Hyd. Veneer Presses.
Merritt 84x54—8—10—12 Plate Redriers
Francis 36x80-in. hand screw veneer press
Large quantity "I" beams and turnbuckles.

MISCELLANEOUS MACHINES
Hanchett GK 36-in. auto. knife grinder.
Food Machinery Co. Model AC-2 boxmaker.
Woods No. 227 side head grinder.
NEW Hanchett No. 133 Auto. Band Resaw Sharpener

This is only a partial list. If the machine you want is not shown, write us.

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THE "HART" LINE

Earle Hart WOODWORKING MACHINE COMPANY

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are the judges. Whether your machines require rebuilding, or you need machinery to help you meet the competitive situations which are ahead, be sure to contact Osborne & Sexton in Columbus. You will find a friendly organization . . . capable and willing to work with you on your engineering and production problems. Write us today.

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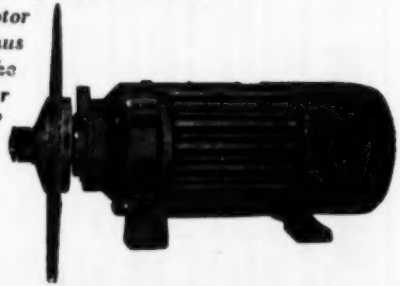

A large stock of Standard Frame 3 phase motors and controls from 1 HP to 125 HP.

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Wilkin-Challoner No. 703 Automatic Plow and Bore Machine

Hayes 72"x25" Double End Tenoner

Hayes 96"x40" Plain Bearing Belt Drive Double End Tenoner with 15 H.P. motor

Hayes 102"x60" Double End Tenoner

Crescent Ball Bearing Electric Single End Tenoner

American No. 1 Single End Tenoner

Mattison No. 55-C—30" Ball Bearing Auto- matic Shaping Lathe

Mattison No. 57-D - 42" Ball Bearing Automatic Shaping Lathe

Jenkins No. 65 Ball Bearing Sash and Door Sticker

Fay & Egan No. 377—10" Belt Drive Moulder

Ekstrom-Carlson No. 464—6" Ball Bearing Moulder

Vonnegut 6" Ball Bearing Electric Moulder

Jones-Superior No. 35 Two Spindle Horizon- tal Borer

Wysong & Miles No. 283-B Single Spindle Borer

Indiana No. 7 Hand Block Belt Sander

Jones-Superior No. 145—30" Disc Sander

Yates-American G-77 Ball Bearing Straight Line Rip Saw

Buss Double Cut-Off Saw

Wilkin-Challoner 72"x40" Electric B. B. Double Cut-Off Saw

Tannewitz 42" Ball Bearing Band Saw

Whitney No. 77 Ball Bearing Tilting Arbor Variety Saw

Greenlee No. 110—36" BB, DMD Single Planer

Porter 300-CM—24" Facer with Herzog Feeder

Fay & Egan 24" Jointer, with 7½ H.P. motor and Jointer Attachment

Mattison No. 244 BB Cut-Off Saw

Billstrom 6' 39 Section Clamp Carrier

Billstrom 7' 29 Section Clamp Carrier

Taylor 19 Section Revolving Clamp Carrier

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Colladay & Crescent 30"

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Towsley No. 3, 2-Spindle Horizontal Radial
Mosk 2-Spindle Horizontal Radial
Keystone 3-Spindle Horizontal 1" centers

CARVER
Minnesota 16-Spindle Multiple Carver

CLAMP
Lancaster No. 500 Air End Clamp

CLAMP CARRIERS
Taylor 7½ Ft. 40 Sec. Chain Type

DOVETAILER
Dodds 10-Spindle Spiral Gear Drive

GLUING MACHINE
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JOINTERS
8", 8", 12", 20" sizes
30" with Billstrom Feeding Attachment
Yates Continuous Feed Glue Jointer

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Imperial Automatic Turning, D.M.D.
Reed 16" Turning Lathe, 16" Swing

MORTISERS
Wysong & Miles No. 271 Hollow Chisel
Fay & Egan No. 462 P.F. Hollow Chisel
Wysong & Miles No. 181, 6-Spindle Horizontal

MOULDERS
Hermance 6" 4-Side
4" & 6" Single Head Stickers

PLANERS
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Whitney 30" Double, 8 feed rolls

SANDERS
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Curtis No. 6 Belt Sander, M.D.
Curtis No. 11 Semi-Automatic Belt Sander
Porter-Cable B-6 Irregular Belt
Wysong & Miles No. 173 Universal Belt
American No. 2, 43" Roll Feed 3-Drum

SAWS—CUT-OFF
Porter Floor Type, with Table
Y-A C-44 Floor Type, with Table
Root No. 248 Double, 32"x82"
Bell No. 12 Double Miter

SAWS—CHAIN FEED
Mattison No. 205, Motor Driven

SAWS—SELF-FEED
Hermance No. 31 Adjustable Roll
Greenlee No. 426
Root and American

SAW TABLES
Tannewitz SJ Tilting Arbor
American Double Revolving Arbor
American No. 7½ Comb. & Dado
Beach D.M.D., Tilting Table

SHAPERS
American No. 1 Single Reversible
Shimer Single Spindle Reversible
Whitney No. 8 Double, Ball Bearing

TENONERS
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Fay & Egan Single End

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Belt Sander, Mattison No. 157, double reversible, motors
Borer, horiz., 2-spdl., Oliver, ballb., mtr.
Boxboard Matcher, Morgan, 12-roll.
Boxboard Printer, C&D 22", 2-color, chain-fd.
Clamp carrier, Billstrom 39-sec., 40"x90", 4 clamps per section
Clamp, revolving case, 78", air cylinder
Clamps, end, Handy 42" and 78" cap., air cylders.
Clamp, Handy No. 195, mitre
Chucking Machine, Bell No. 245, auto., air operated, mtrs.
Cut-Off Saw, dbl.-end, Wilkin-Challoner, elec., chain-fd., 80"x40"
Cut-Off Saw, dbl., Buss 80"x20"
Cut-Off Saw, dbl., Beach 80"x24", roller table
Gluer, 8" Black, m.d., heating element
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Mortiser, chain-saw, New Britain No. 3
Nailers, Morgan & Doig, 6 to 28-tr., open & cl. back, with & without clinching att.
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Planer, single, Yates-Am. B-7, 4-kn. rd. hd., 20 h.p. 3600 rpm cyl. mtr. 7½ h.p. fd. mtr., will feed 110' per minute
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Planer, dbl., ballb., Yates B-2, 30", motors
Planer, dbl., Am. No. 80 fast-fd., 30"x8", 8-kn. rd. hds., direct motor driven
Ripsaw, self-fd., Sinker-Davis, 10 h.p.
Router, elec., Porter No. 612, 3 h.p.
Ripsaw, chain-fd., Diehl No. 75, 2-mtrs.
Sander, 3-dr., s.b., Smith 42", mtrs.
Sander, 2-dr., Am. 12", motor.
Sanders, 2-dr., F-E 24"; Beach 42", ballb. mtrs.
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Sander, horiz., flat belt, B.&M. 20", 7½ h.p.
Sander, edge belt, Ekstrom-Carlson No. 111, mtr.
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Sticker, 3-s., Wilkin-Challoner, ballb., mtrs.
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Veneer Presses, Tewsley 24" and 38", 3-screw

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Buss No. 4A - 36" Motor Driven Ball Bearing Single Planer
Hermance No. 44 25" M.D., B.B., Single Planer
Onsrud W-240 High Speed Electric Router
Superior No. 145—30" Motor Driven Disc Sander, tilting table
Nash No. 79 Motor Driven Ball Bearing Auto. Turning Sander for handles, etc.
Yates No. 431—31" Motor Driven Triple Drum Endless Bed Sander
Yates No. 430 D.M.D. Hand Block Belt Sndr.
J. A. Fay & Egan No. 50—36" Band Saw Machine, vee belt motor drive
J. A. Fay & Egan No. 377—10" Ball Brg. Moulder, belted mtr. dr. to countershaft
Mattison No. 244 Direct Motor Driven Straight Line Cut Off Saw
Tannewitz 42" Direct Motor Driven, Ball Bearing Band Saw
Tannewitz Type J Motor Driven Tilting Arbor Variety Saw
Tannewitz Type G 36" Direct Motor Driven Ball Bearing Band Saw
Beach No. 3 Motor Driven Ball Bearing Double Cut Off Saw
Yates-American G44 Motor Driven Straight Line Cut Off Saw
Greenlee No. 110—36" Direct Motor Driven Ball Bearing Single Surfacer
Billstrom 29 and 39-section clamp carriers
Whitney No. 24—30" Motor Driven Ball Bearing Double Head Surfacer
Whitney No. 77, Motor Driven Ball Bearing Tilting Arbor Saw
Whitney No. 295 Direct Motor Driven Double Spindle Automatic Shaper
Orton M.D., B.B. Sgl. Spdl. Shaper, tilt. Spdl.

GUSTAFSON & SCOTT MFG. CO.

1637 N. LOWELL AVE. **CHICAGO 39, ILLINOIS**

PRODUCTS INDEX

Compiled for quick reference and for your convenience, this handy index of products shows the pages on which you will find the items advertised in this issue. When writing to advertisers, it will be appreciated if you will mention WOOD WORKING DIGEST.

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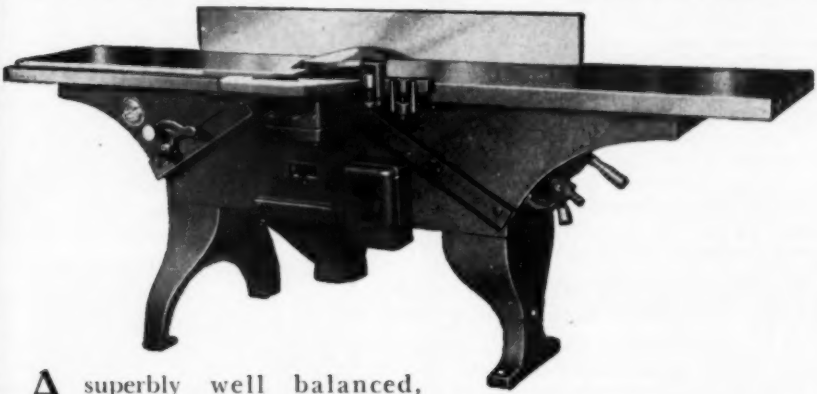
TWELVE AND SIXTEEN INCH

Heavy Duty HAND JOINTER



A superbly well balanced, smooth operating machine designed for heavy production where the finest quality and accuracy are desired. The operator is permitted to work in a completely relaxed and normal manner, reducing fatigue, improving the safety factor, and assuring the maximum production volume.

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- Band Saws
- Surfacers
- Wood Shapers
- Jointers
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- Universal Woodworkers

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NORTHFIELD, MINNESOTA., U. S. A.

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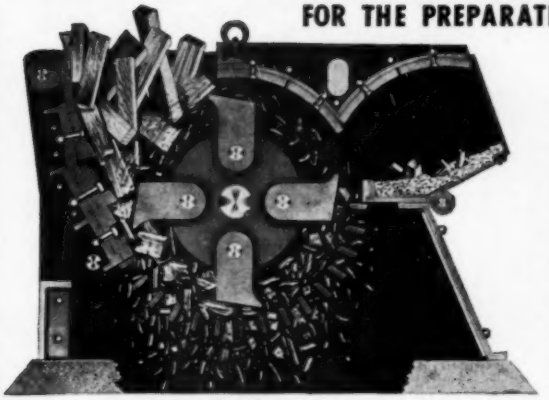
WILLIAMS "NO-NIFE" HOGS

FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

The Williams "No-Nife" Hog will reduce wet or dry Veneer and Plywood Scrap to a uniform size wth no long slivers or big pieces—thus the finished product can easily be handled in pneumatic air lines. No need to worry about elbows of your system becoming clogged. Hundreds of satisfied users attest to their dependability.

WC51-2

CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
- Larger feed opening.
- Hinged cover—instant accessibility.
- No knives to sharpen or be damaged by tramp iron.

WILLIAMS ALSO MAKES...

Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

Williams Patent Crusher & Pulverizer Co.

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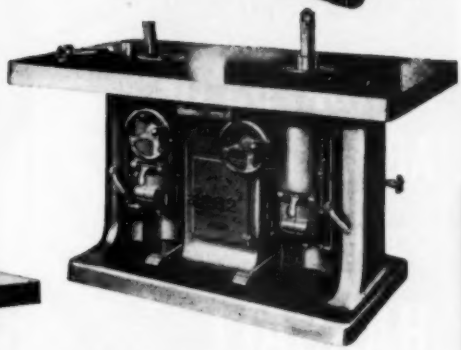
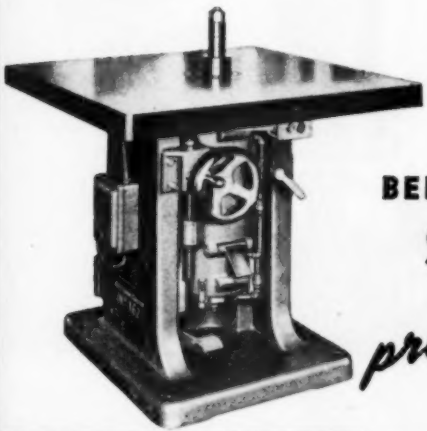
EKSTROM, CARLSON

The picture at the right shows the No. 262 ECCo Two-Spindle High Speed Shaper. Below is a picture of the No. 162 Single Spindle Shaper. Not shown is the No. 366, which is identical to the No. 262 but with a larger table and greater center distance of spindles.





BELTED, MOTOR-DRIVEN SHAPERS

produce Quality Work at Low Cost...

CONDENSED SPECIFICATIONS

	162	262	366
Spindle Speed	8500 rpm	8500 rpm	8500 rpm
Number of Spindles	1	2	2
Center Distance between Spindles	—	26"	30"
Vertical Spindle Adjustment	6"	6"	6"
Spindle to Front of Table	18"	18"	18"
Height, Floor to Table	35"	35"	35"
Work Table Size	38"x40"	38"x62"	38"x67"
Motor Sizes	3, 5, or 7½ hp	5 or 7½ hp	5 or 7½ hp

The solid construction and precision workmanship in ECCo Shapers pays off on the production line. Work moves past the knives with little effort on the part of the operator and comes off the machine so smooth and so beautifully shaped that sanding becomes a negligible factor. There are important places in your plant for ECCo Shapers — places where lagging production lines can be speeded up, where important pieces can be whisked out swiftly and accurately at a cost in keeping with the demand of buyers. The experience and know-how gained through five decades of serving the woodworking industry are incorporated into ECCo machines. For knives, use superior Casino Shaper Steel, finished and heat-treated by Ekstrom, Carlson to meet the exacting needs of high speed precision cutting equipment.

Write for Bulletins 162, 262, and 366

MANUFACTURERS OF QUALITY WOODWORKING MACHINERY SINCE 1904

ECCO

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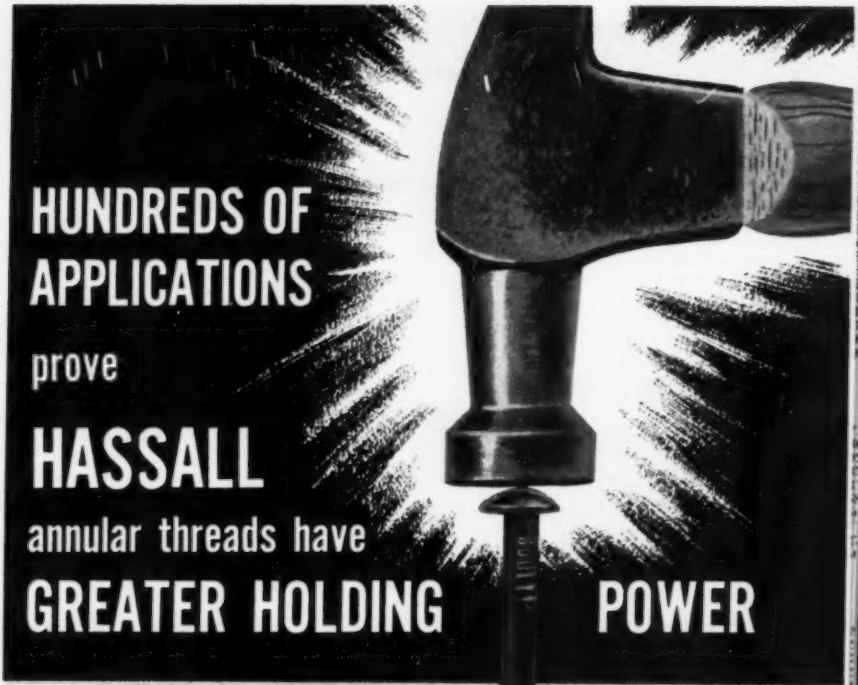

HUNDREDS OF APPLICATIONS prove HASSALL annular threads have GREATER HOLDING POWER

Annular threads are used where greater grip is a "must" — in industries like shoe manufacturing, asbestos siding, underlay flooring for linoleum, pallet manufacturing, boat building, etc., etc. The stronger holding power of these threads should solve many a wood fastening problem, maybe yours! Save, too, by using fewer nails. Write for samples.

SPECIAL NAILS RIVETS SCREWS

Hassall

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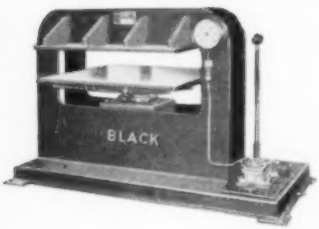
Presses

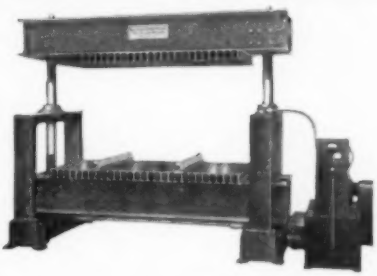


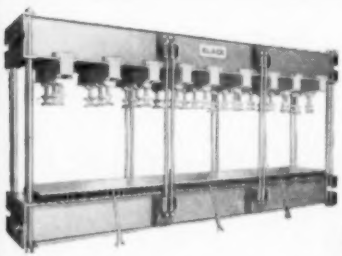
HYDRAULIC PRESSES

Black's hydraulic laminating press is designed for laboratory and experimental work or light production operation. It is strongly made of modern steel-plate frame construction. Variations may be had in the width of platen, vertical opening, length of stroke, and total pressure applied. Write for Bulletin 11-P.

ELECTRIC PRESSES

Black's electric press is fast and efficient on laminating jobs which require moderate pressure. Presses with a capacity from 36" x 36" to 48" x 144" with a 44" vertical opening are available. Its unfailing ruggedness and durability results from simple, straight-forward design with a minimum of parts. Write for Bulletin 11-E.





HAND POWERED PRESSES

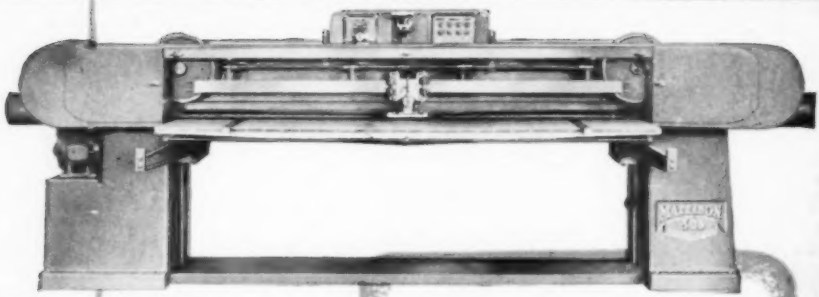
Black Hand Screw Plywood or Glue Presses are made for work of any dimension. Ten sizes of sectional presses are offered from 12" to 18" in width and 18" to 102" between uprights, and which may be set side by side to form presses of any required length. All-steel presses are available in a complete range of sizes for every conceivable requirement. Write for Bulletin 11-G.

"If its gluing equipment—we have it"

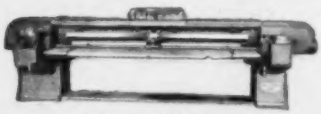
write today . . .

THE BLACK BROTHERS CO., INC. **820 9th St., MENDOTA, ILLINOIS**

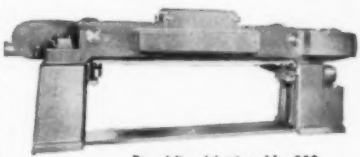
MATTISON'S NEW
No. 303 Automatic STROKE SANDER



Front View Mattison No. 303
Automatic Stroke Sander — Single Belt



Mattison No. 303
Automatic Stroke Sander — Double Belt



Rear View Mattison No. 303
Automatic Stroke Sander Single Belt

● The Mattison No. 303 Automatic Stroke Sander is the last word in modern engineering. From the standpoint of design — construction — smoothness of operation and appearance, it is in a class by itself. Results that can be expected are faster output, better quality of work, and trouble free operation. These important features are all to your advantage. Hydraulic system for operation of shoe is simple yet positive in action, providing smooth operation of sanding shoe the entire length of stroke. Belt speeds to meet your needs. All controls are within easy reach of operator. The sand belt is completely enclosed at top and both ends for dust control and safety. Belts are easily and quickly changed. Aluminum sanding shoe is mounted on ball bearings for easy operation and control. Massive base and column construction provide solid foundation. The Mattison No .303 Automatic Stroke Sander is recommended as the most efficient method for finish sanding large, flat surfaces such as tops, panels, doors, etc. It provides perfect work on a real production basis. Double-belt model with coarse belt for removing tape and glue, and fine belt for finish sanding, speeds up production by reducing handling time and, in many cases, eliminates drum sander operation.

Send for complete information on the 303, the latest in stroke sanders.

MATTISON MACHINE WORKS

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